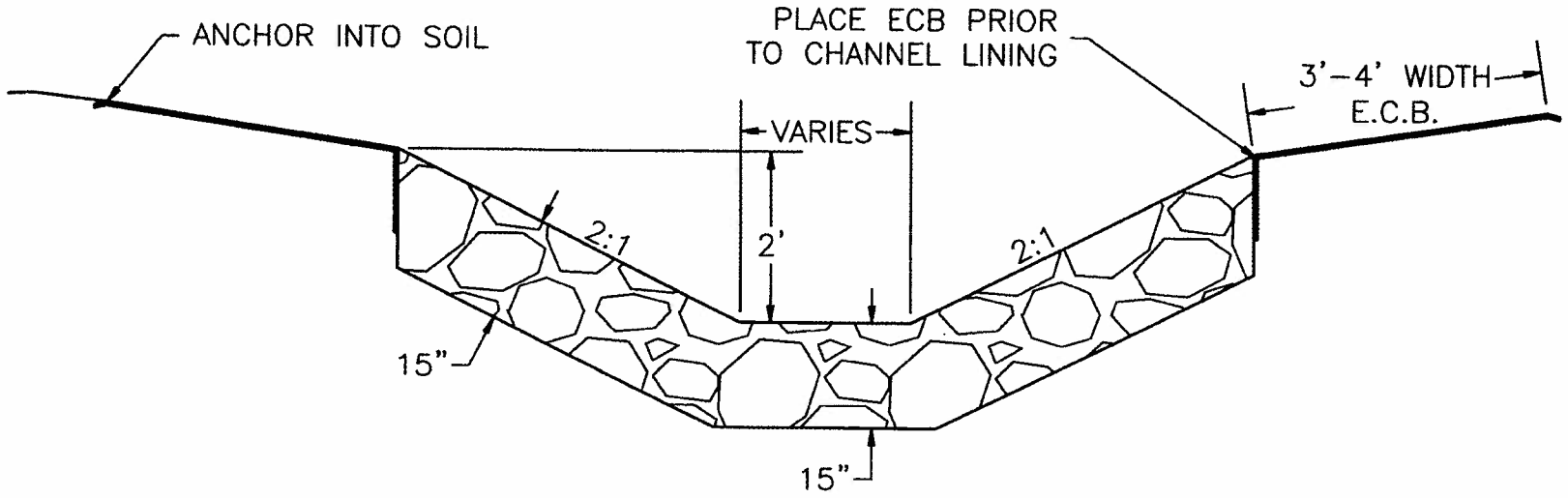
DRAINAGE

SURFACE

NOTE: FILTER FABRIC SHALL BE PLACED UNDER ALL DITCHES WITH CHANNELS FLATTER THAN 10%. EXCAVATE DITCH TO DEPTH WERE WATER RUNS OVER ROCK ON SIDES INTO DITCH.

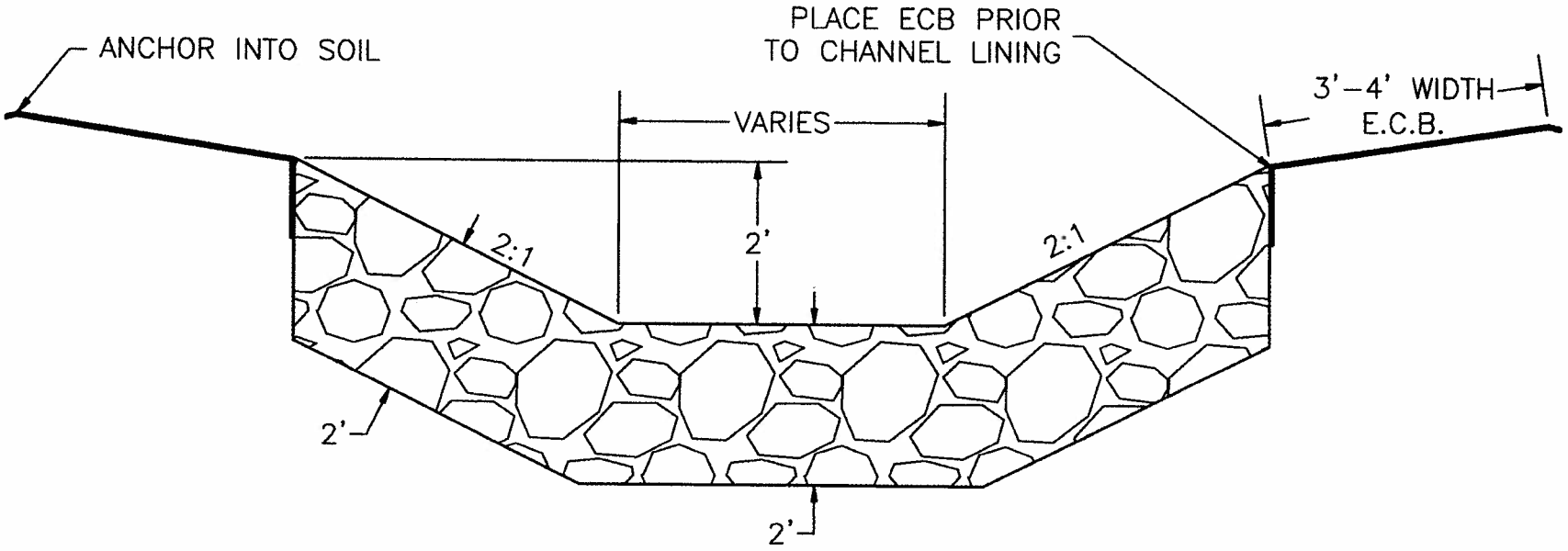


BOTTOM WIDTH (LF)	CLASS II (TON/LF)	FILTER FABRIC (SQ YD/LF)	ECB (SQ YD/LF)
2	0.68	1.55	1
4	0.81	1.75	1
6	0.94	1.95	1

SCALE 1:2

FLAT BOTTOM CLASS II DITCH
AMLSUR 1

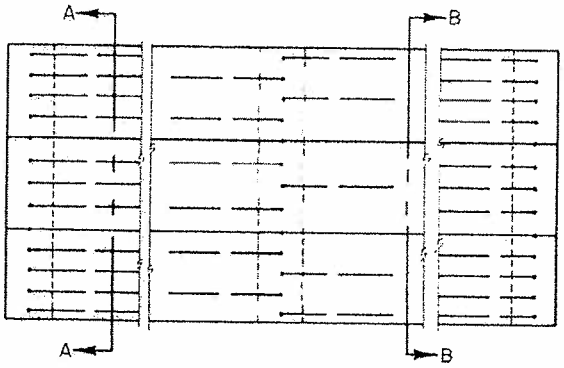
NOTE: FILTER FABRIC SHALL BE PLACED UNDER ALL DITCHES WITH CHANNELS FLATTER THAN 10%. EXCAVATE DITCH TO DEPTH WERE WATER RUNS OVER ROCK ON SIDES INTO DITCH.



BOTTOM WIDTH (LF)	CLASS II (TON/LF)	FILTER FABRIC (SQ YD/LF)	ECB (SQ YD/LF)
4	1.3	1.45	1
6	1.5	2.16	1
8	1.7	2.88	1

SCALE 1:2

FLAT BOTTOM CLASS III DITCH
AMLSUR 2

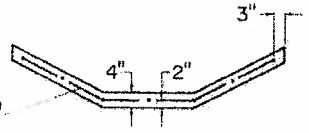


·PLAN·

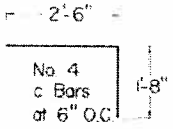
APPROX. STEEL QUANTITIES FOR MINIMUM SECTION SHOWN

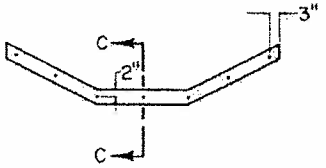
END ANCHORS (EACH)	36.19	LBS.
INTERMEDIATE ANCHORS (EACH)	36.19	LBS.
CONSTRUCTION JOINTS (EACH)	9.352	LBS.
BARS PER SQ. YD. OF DITCH	12.047	LBS.

No. 4 Bars spaced 12" O.C. longitudinally & transversely throughout the section (In addition to Anchor Steel)

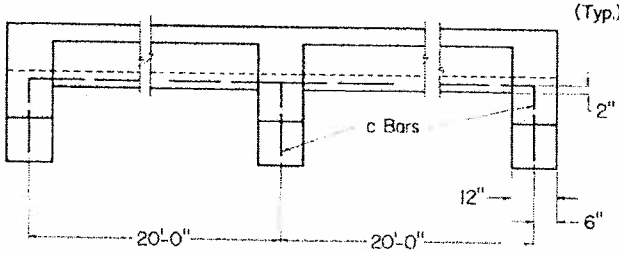


·SECTION B-B·

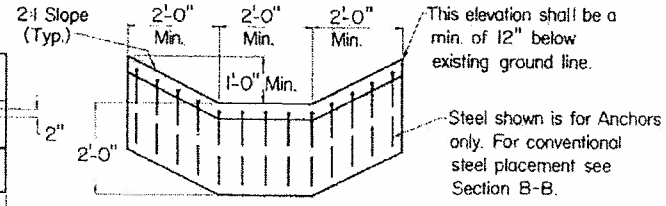




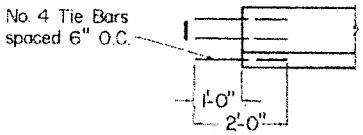
·TIE BAR SECTIONAL VIEW·



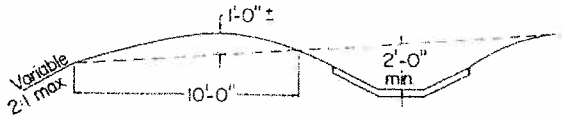
·ELEVATION·



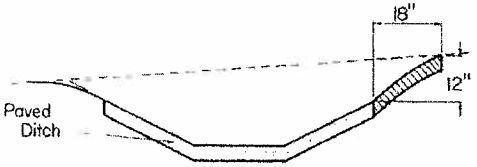
SECTION A-A

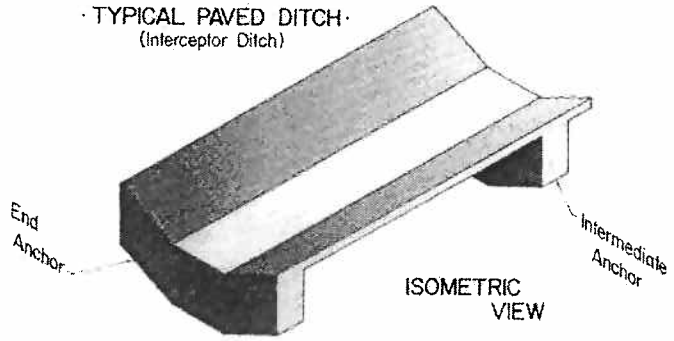


·SECTION C-C·



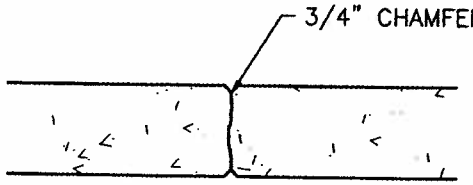
·TYPICAL PAVED DITCH·
(Interceptor Ditch)





ISOMETRIC
VIEW

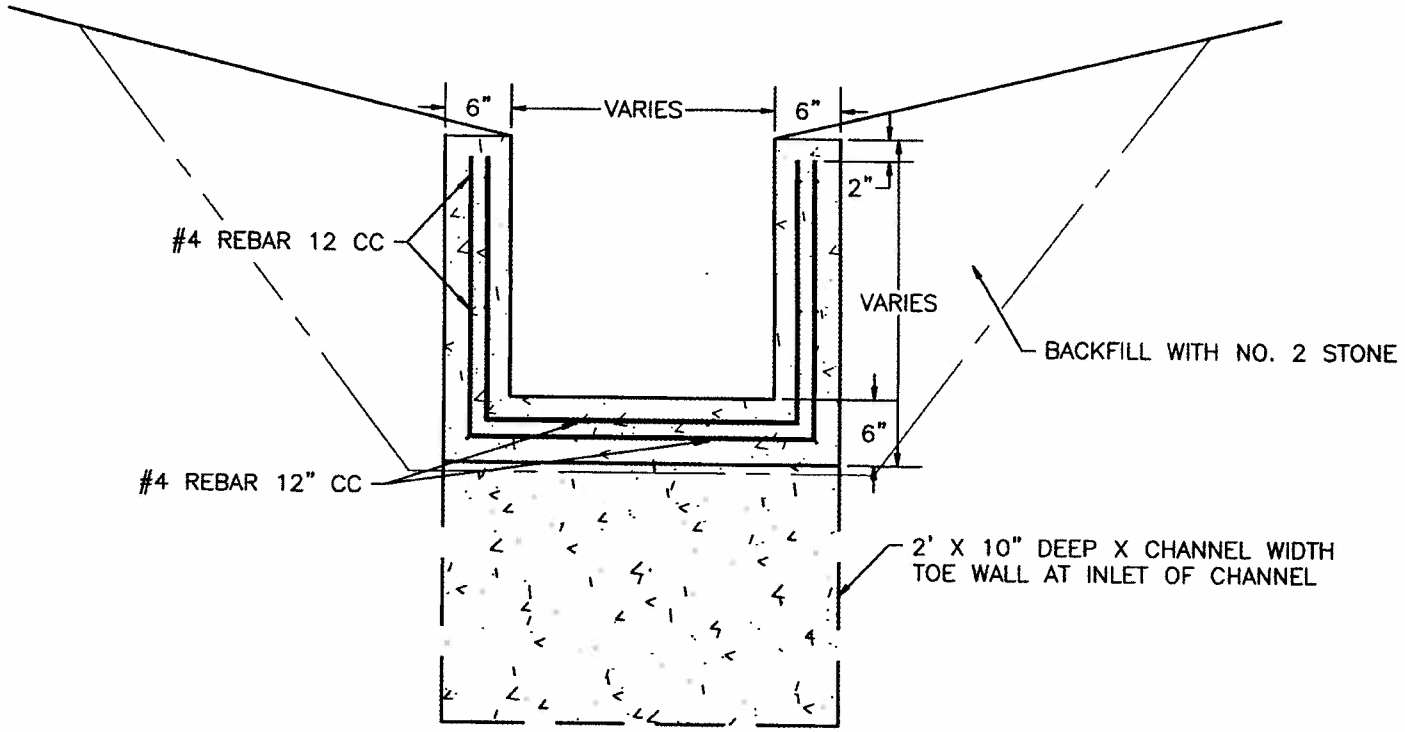
2' FB CONCRETE DITCH
AMLSUR 3



CONCRETE JOINT

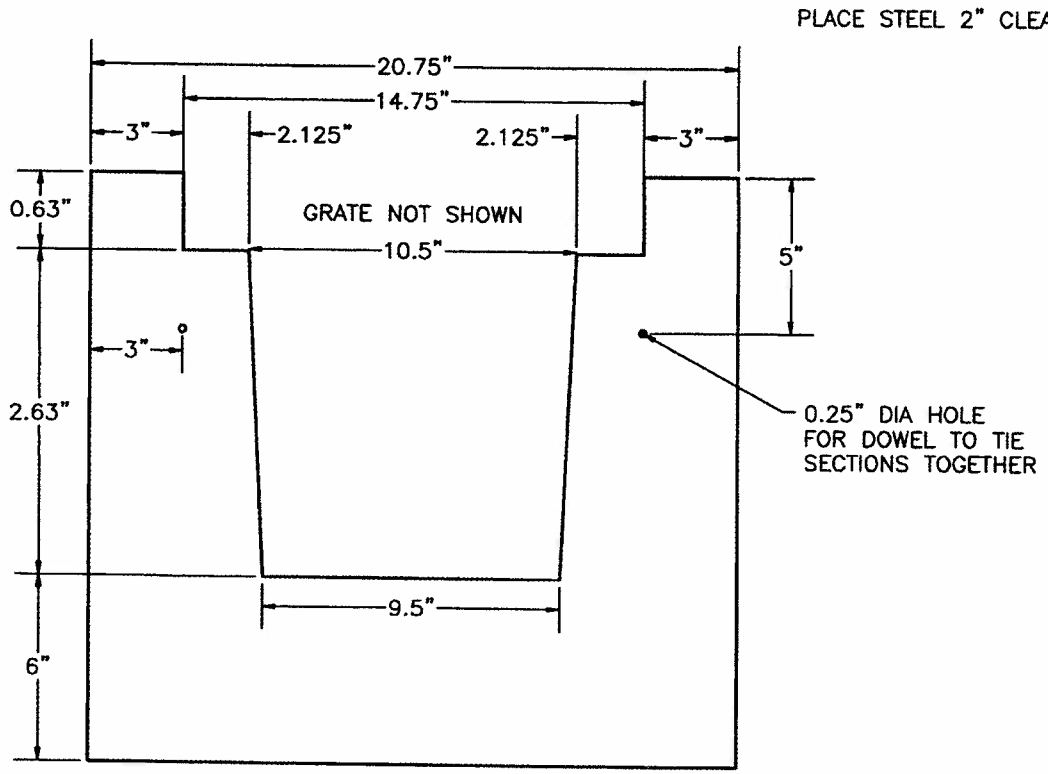
CONSTRUCTION JOINTS SHALL BE PLACED A MINIMUM OF 10' & A MAXIMUM OF 20'. ALL BAR SPLICES SHALL BE A MINIMUM OF 18" AND A MAXIMUM OF 24".

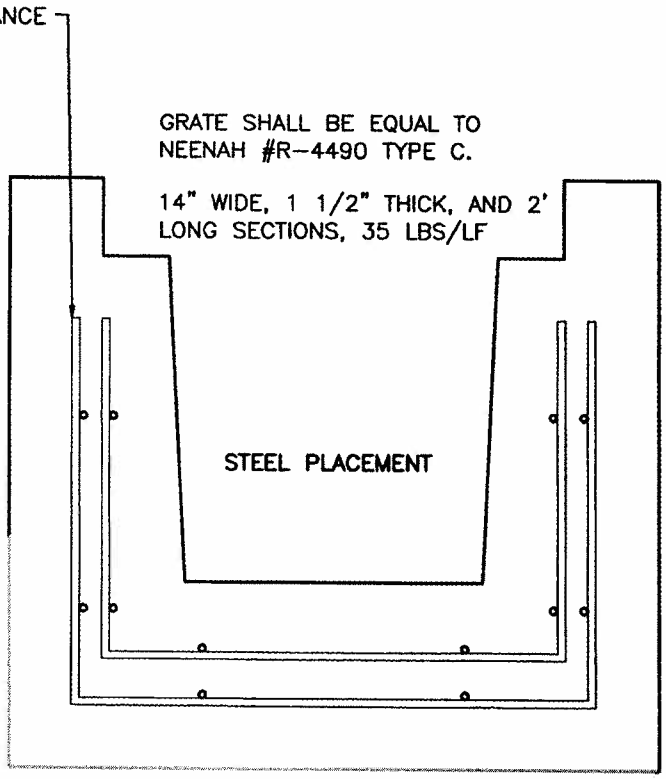
ALL STEEL REINFORCEMENT SHALL BE 60 KIP. ALL CONCRETE SHALL BE 4000 PSI.



ALL REBAR SHALL HAVE 2" MIN CLEARANCE. INSTALL SIDEWALLS COMPLETELY BELOW GROUNDLINE.

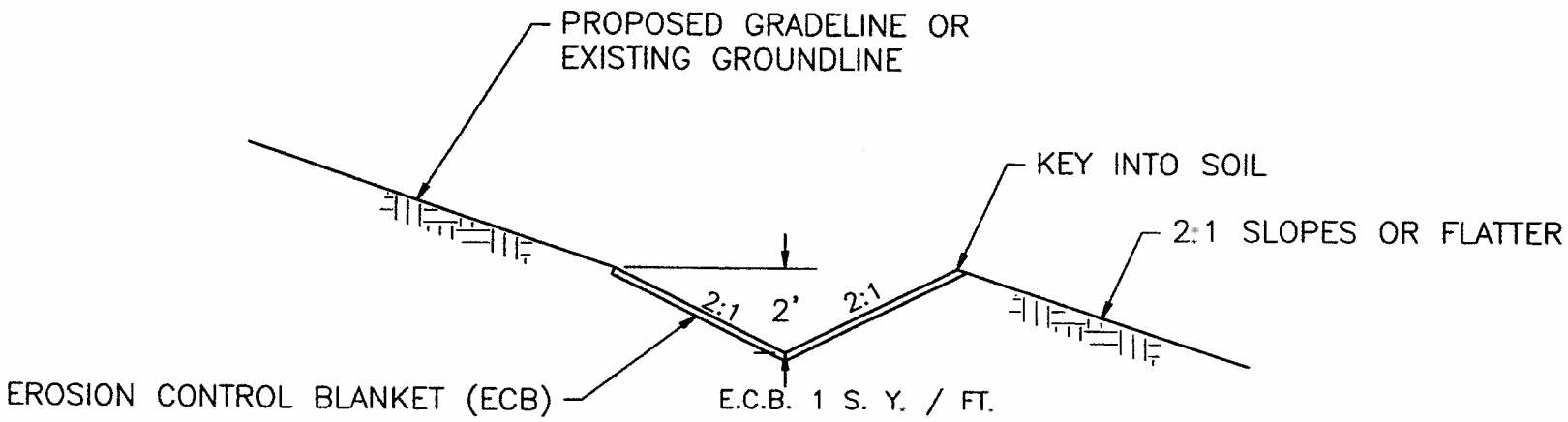
RECTANGULAR CONCRETE DITCH
AMLSUR 4





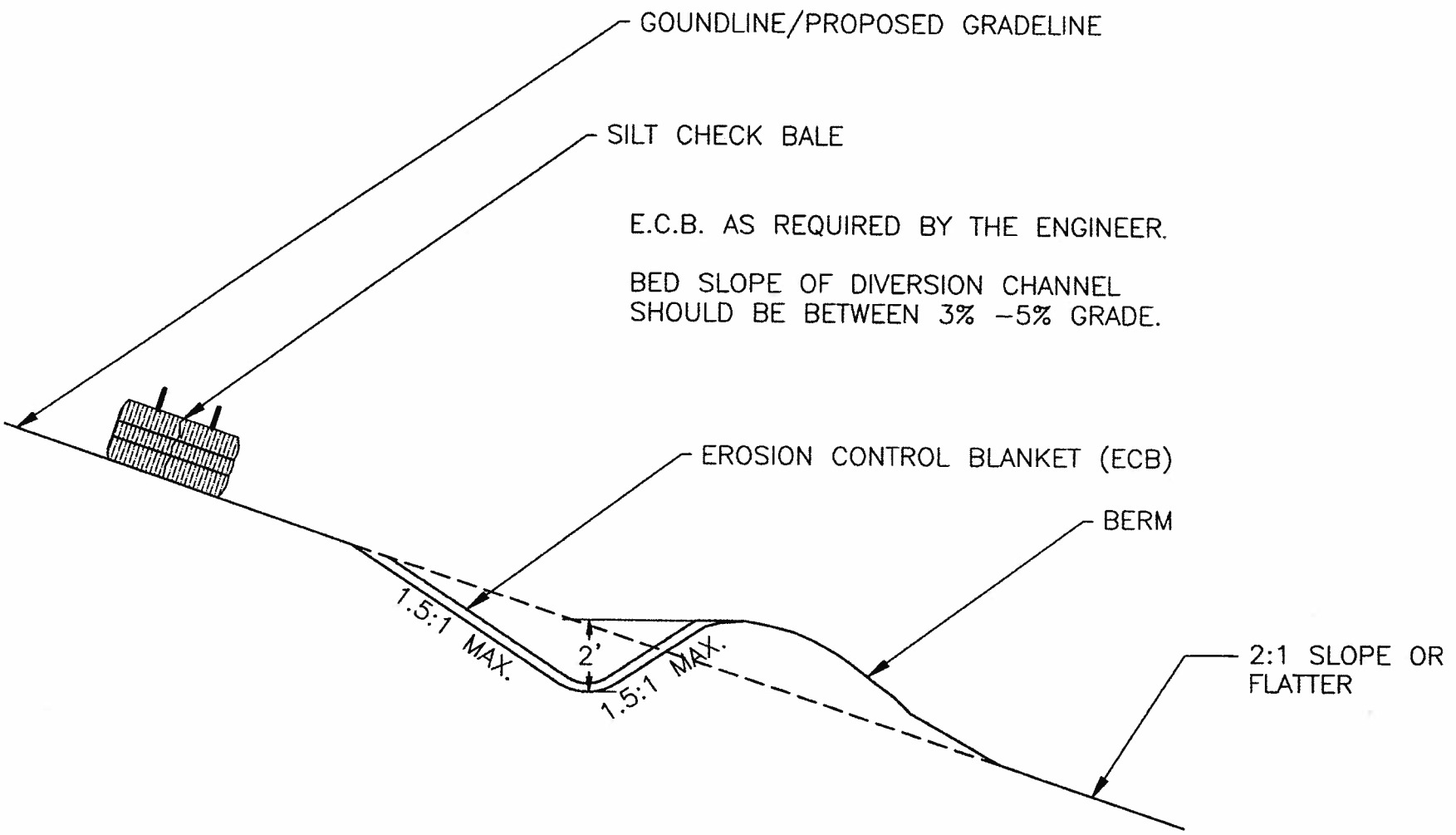
ALL STEEL #4 REBAR

GRATED RECTANGULAR CONCRETE DITCH
AMLSUR 5



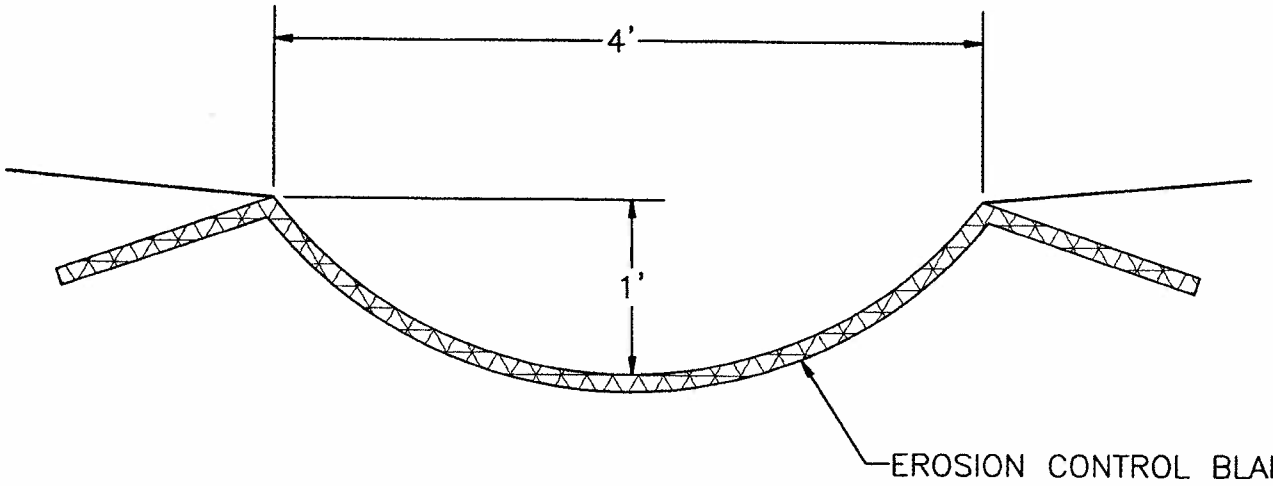
SCALE 1:4

ECB "V" DITCH
AMLSUR 6



ECB DIVERSION DITCH WITH BERM
AMLSUR 7

ANCHORS SHALL BE PLACED AT ALL TRAVERSE SEAMS AND MAX 100' APART ON SLOPES >7%.

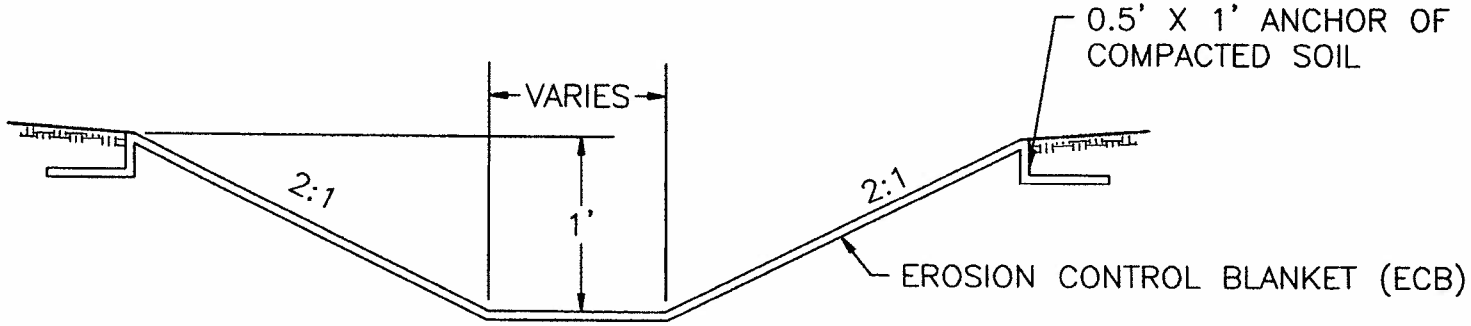


ECB = 0.8 SY/LF

SCALE: 1:1

4' ECB SWALE DITCH
AMLSUR 8

NOTE: SOIL AMENDMENTS AND SEED SHALL BE APPLIED BEFORE INSTALLING EROSION CONTROL BLANKETS.



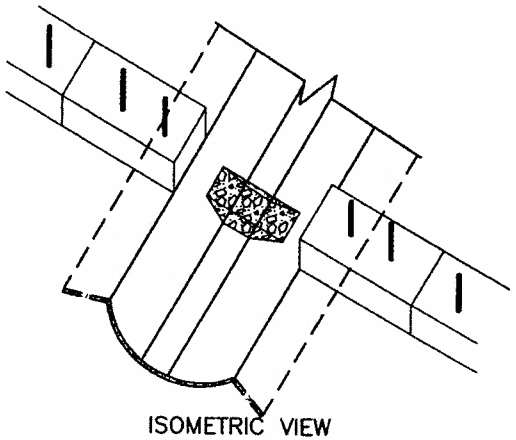
2' FB ECB = 1.75 SY/LF
4' FB ECB = 1.95 SY/LF

SCALE: 1:2

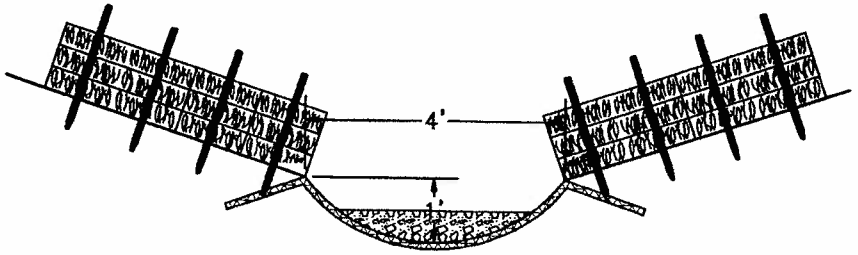
FLAT BOTTOM ECB DITCH
AMLSUR 9

NOTES:

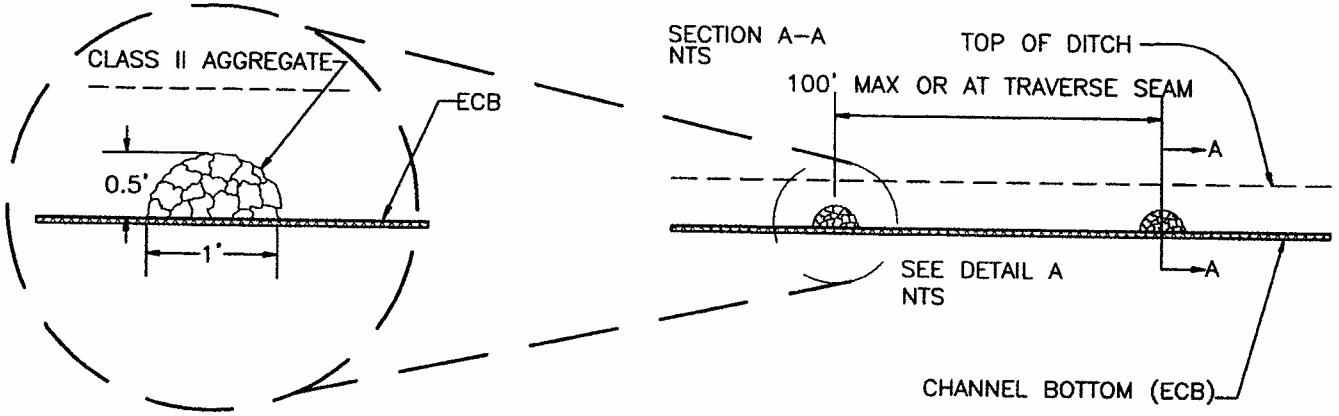
1. SPACING OF ANCHORS SHALL BE AT ALL TRAVERSE SEAMS AND AS STATED ON THE SITE SPECIFIC DRAWINGS.
2. TWO HAYBALES SHALL BE PLACED ON EACH SIDE AT ALL ANCHOR LOCATIONS
3. SOIL AMENDMENTS AND SEED SHALL BE APPLIED BEFORE INSTALLING EROSION CONTROL BLANKETS.



ISOMETRIC VIEW
NTS



SECTION A–A
NTS



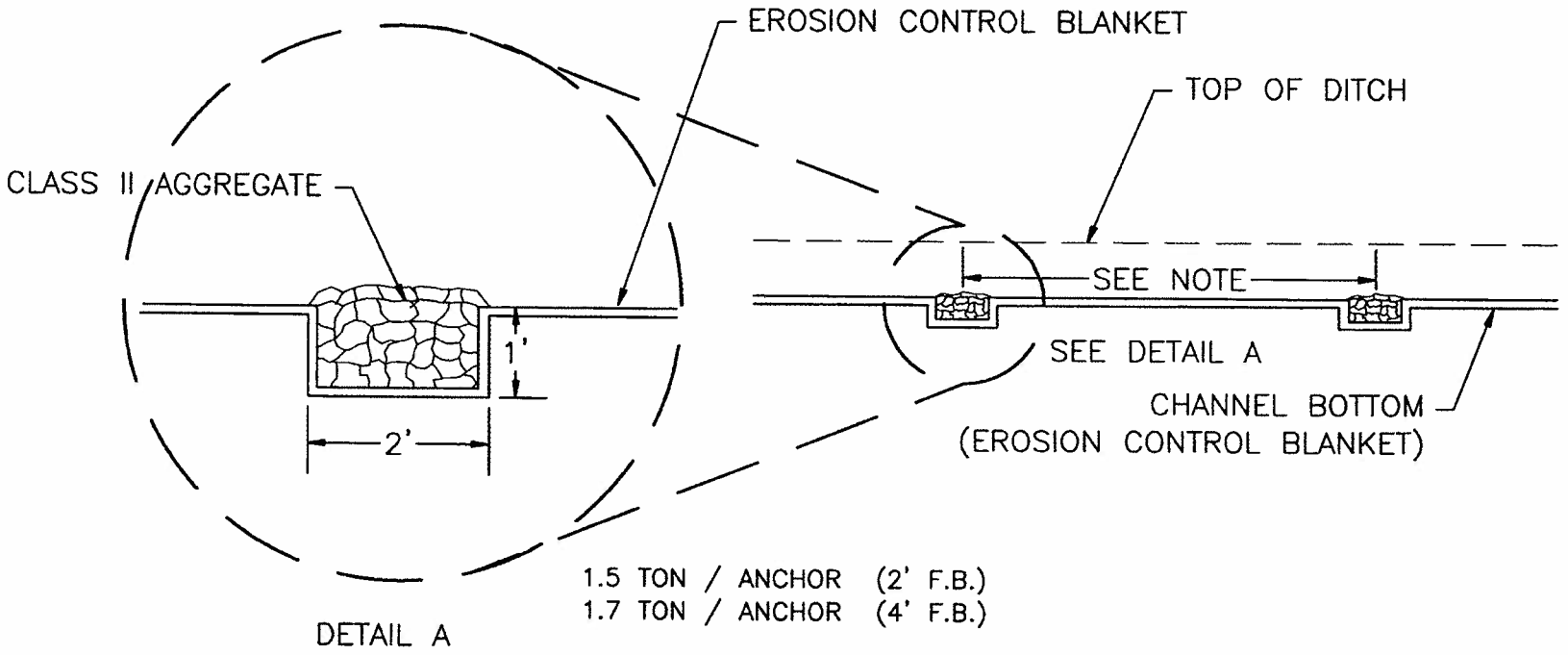
DETAIL A
NTS

ECB ANCHOR– TYPE A
AMLSUR 10

NOTES:

1. SPACING OF ANCHORS SHALL BE AT ALL TRAVERSE SEAMS AND AS STATED ON THE SITE SPECIFIC DRAWINGS.

2. SOIL AMENDMENTS AND SEED SHALL BE APPLIED BEFORE INSTALLING EROSION CONTROL BLANKETS.

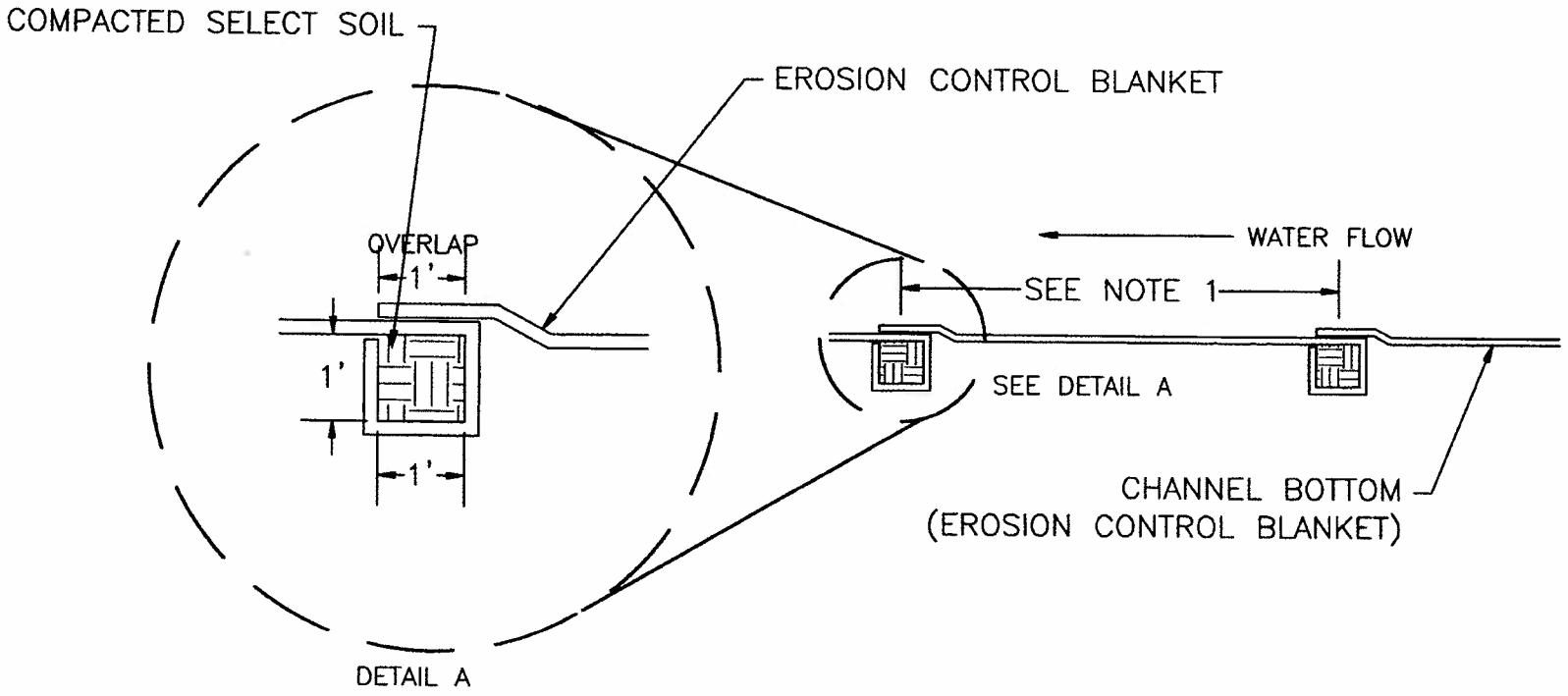


ECB ANCHOR– TYPE B
AMLSUR 11

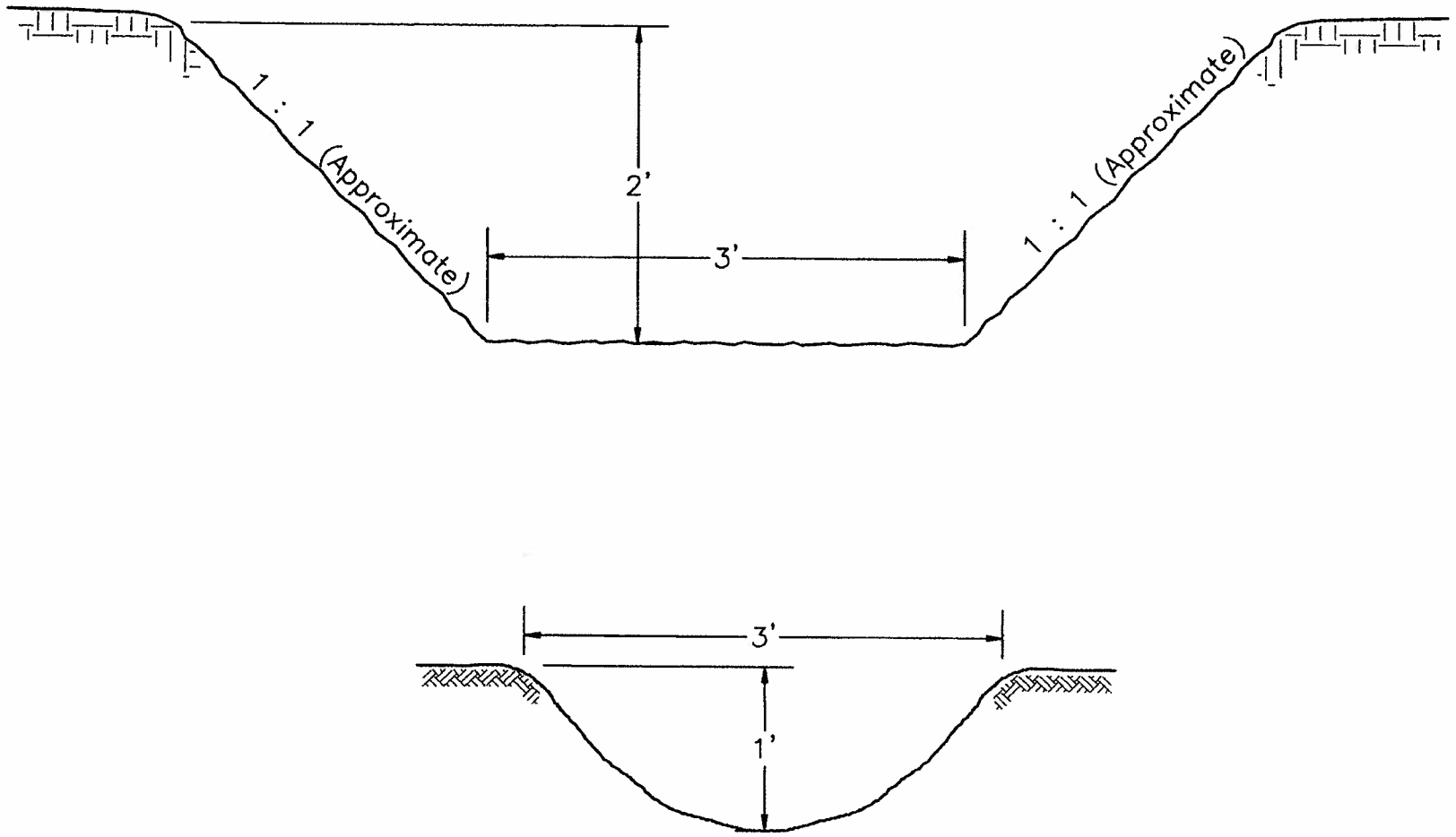
NOTES:

1. SPACING OF ANCHORS SHALL BE AT ALL TRAVERSE SEAMS AND AS STATED ON THE SITE SPECIFIC DRAWINGS.

2. SOIL AMENDMENTS AND SEED SHALL BE APPLIED BEFORE INSTALLING EROSION CONTROL BLANKETS.



ECB ANCHOR– TYPE C
AMLSUR 12

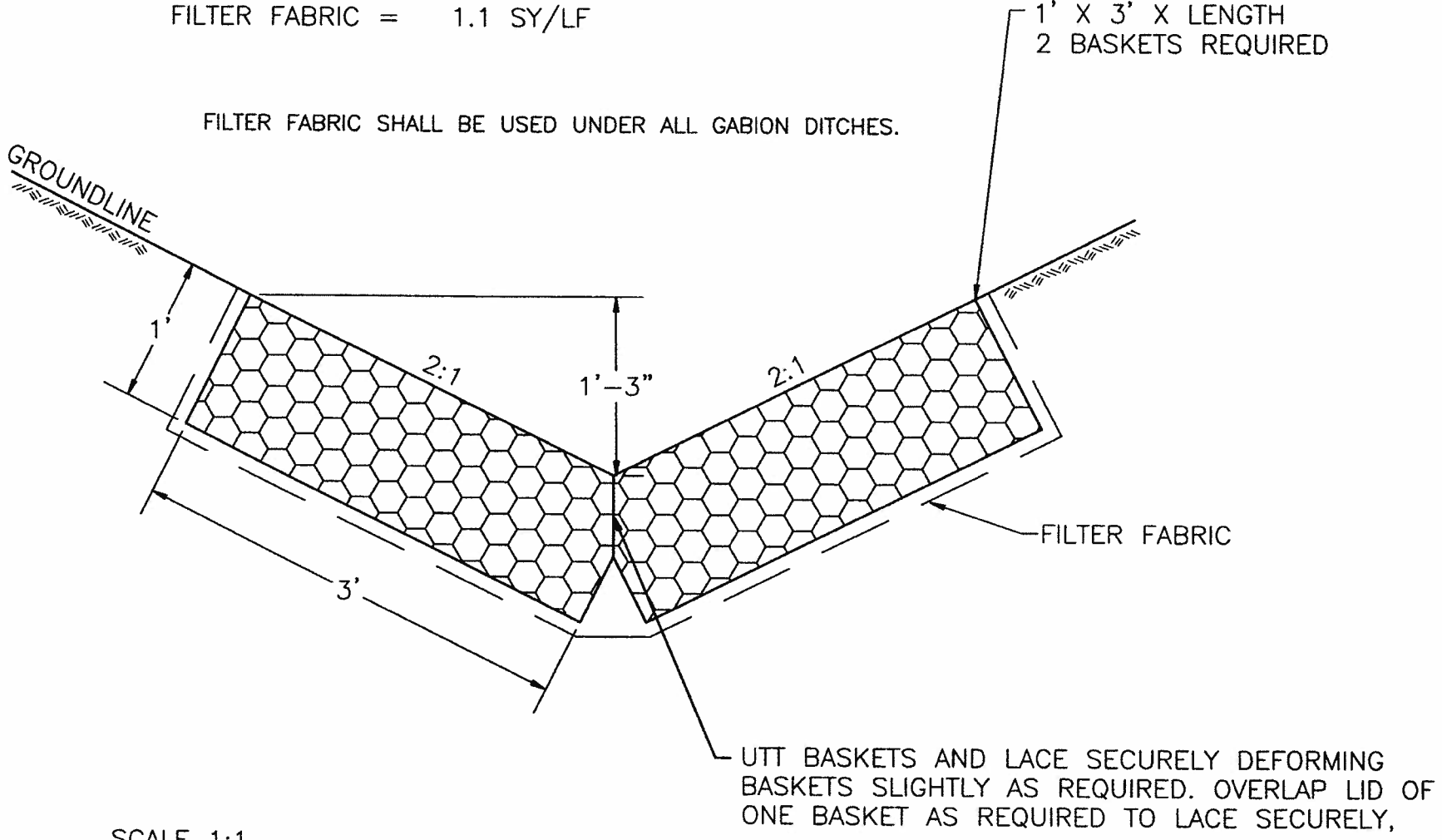


SCALE 1:1

EXCAVATED ROCK DITCHES
AMLSUR 13

GABION = 0.22 CY/LF
FILTER FABRIC = 1.1 SY/LF

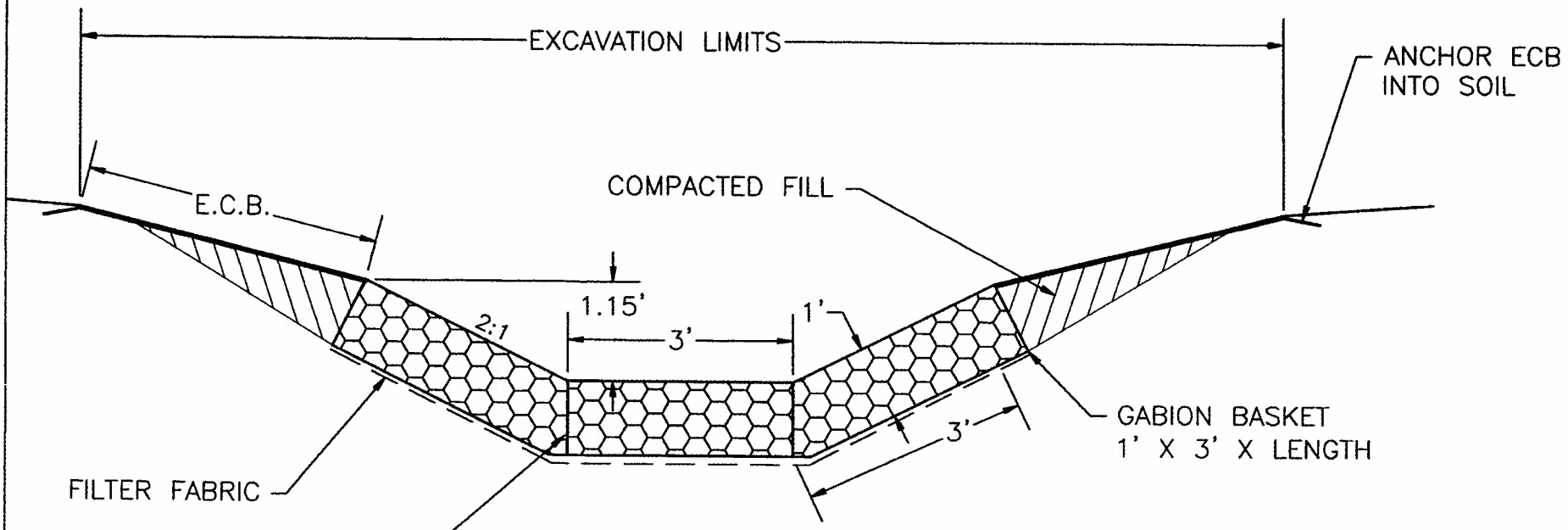
FILTER FABRIC SHALL BE USED UNDER ALL GABION DITCHES.



SCALE 1:1

GABION "V" DITCH
AMLSUR 14

NOTE: FILTER FABRIC SHALL BE PLACED UNDER ALL DITCHES WITH CHANNELS FLATTER THAN 10%.

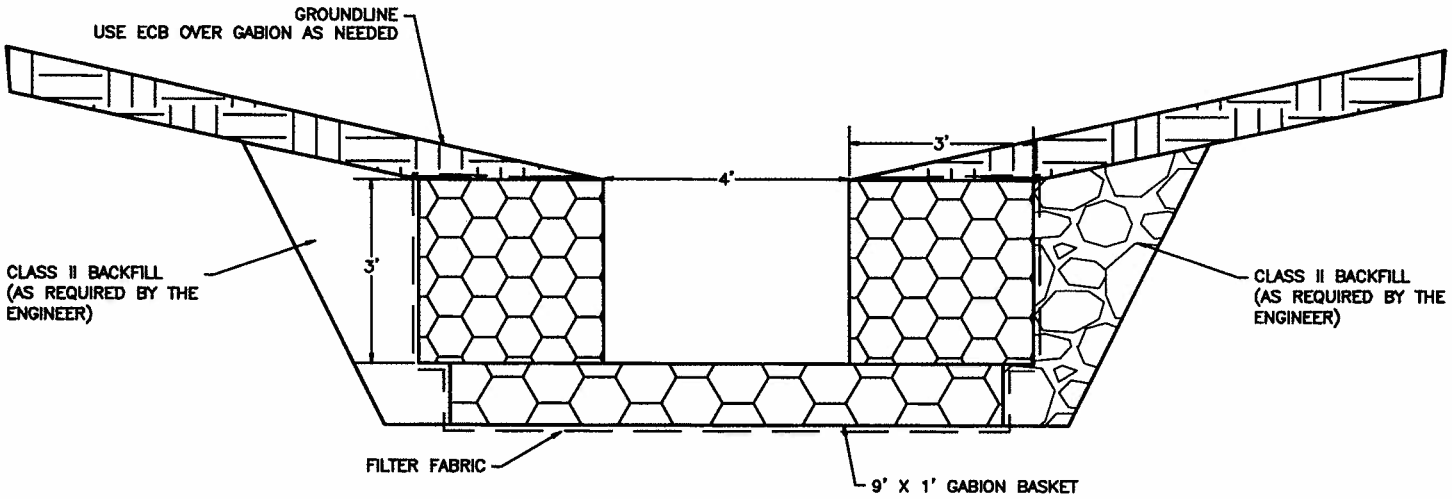


GABION	0.35 CY/LF
FILTER FABRIC	1.13 SY/LF
ECB	1.0 SY/LF

SCALE 1:2

TRAPEZOIDAL GABION DITCH
AMLSUR 15

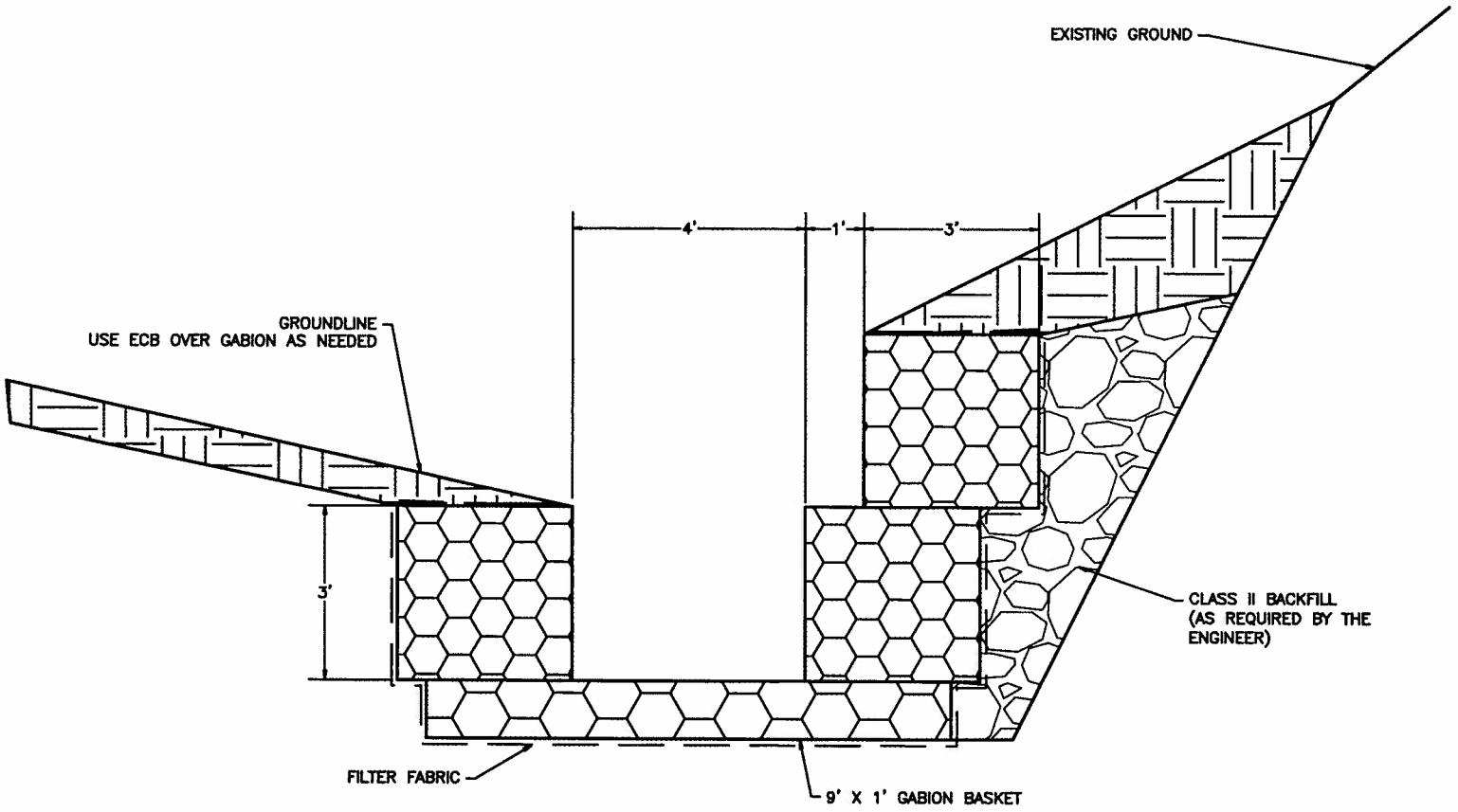
NOTE: FILTER FABRIC SHALL BE PLACED UNDER ALL DITCHES WITH CHANNELS FLATTER THAN 10%.



GABION	1.0 CY/LF
FILTER FABRIC	2.8 SY/LF
CLASS II BACKFILL	0.77 TON/LF
ECB	1 SY/LF

SCALE: 1:3

4' FB RECTANGULAR GABION DITCH
AMLSUR 16-1

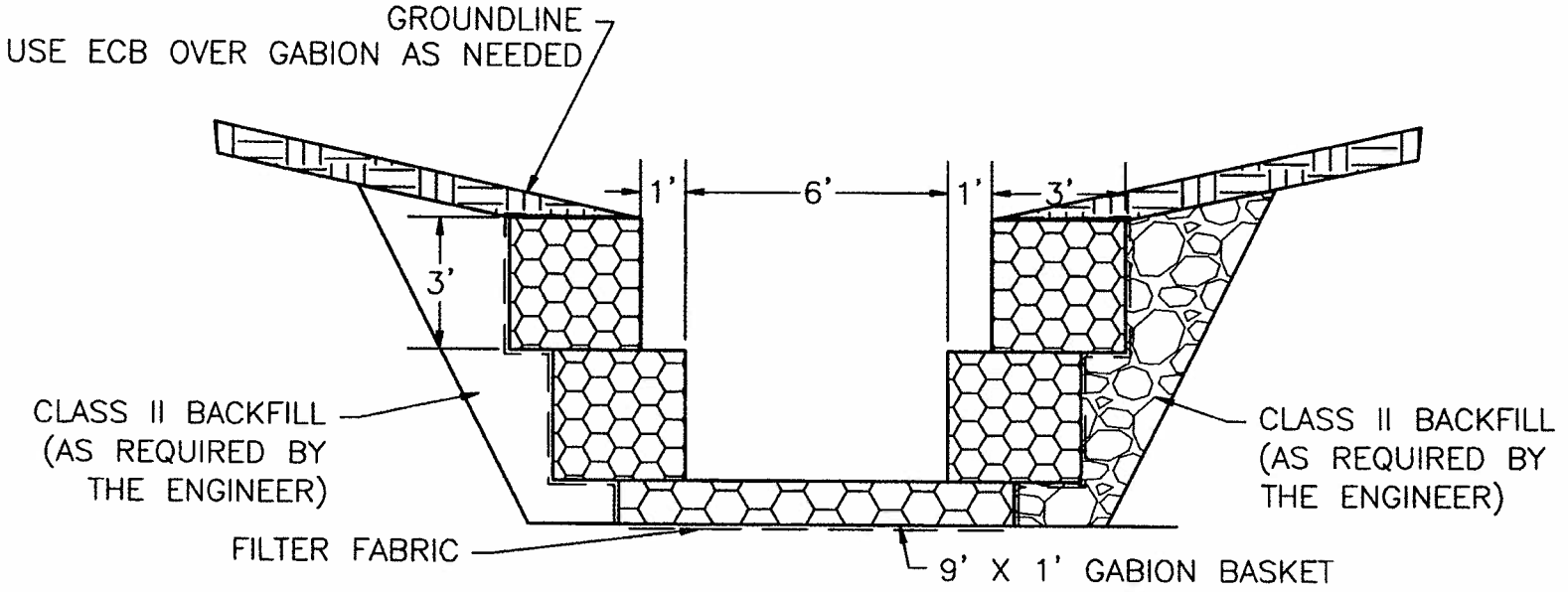


GABION	1.8 CY/LF
FILTER FABRIC	2.8 SY/LF
CLASS II BACKFILL	1.4 TON/LF
ECB	1 SY/LF

SCALE 1:3

4' FB RECTANGULAR GABION DITCH
AMLSUR 16-2

NOTE: FILTER FABRIC SHALL BE PLACED UNDER ALL DITCHES WITH CHANNELS FLATTER THAN 10%.

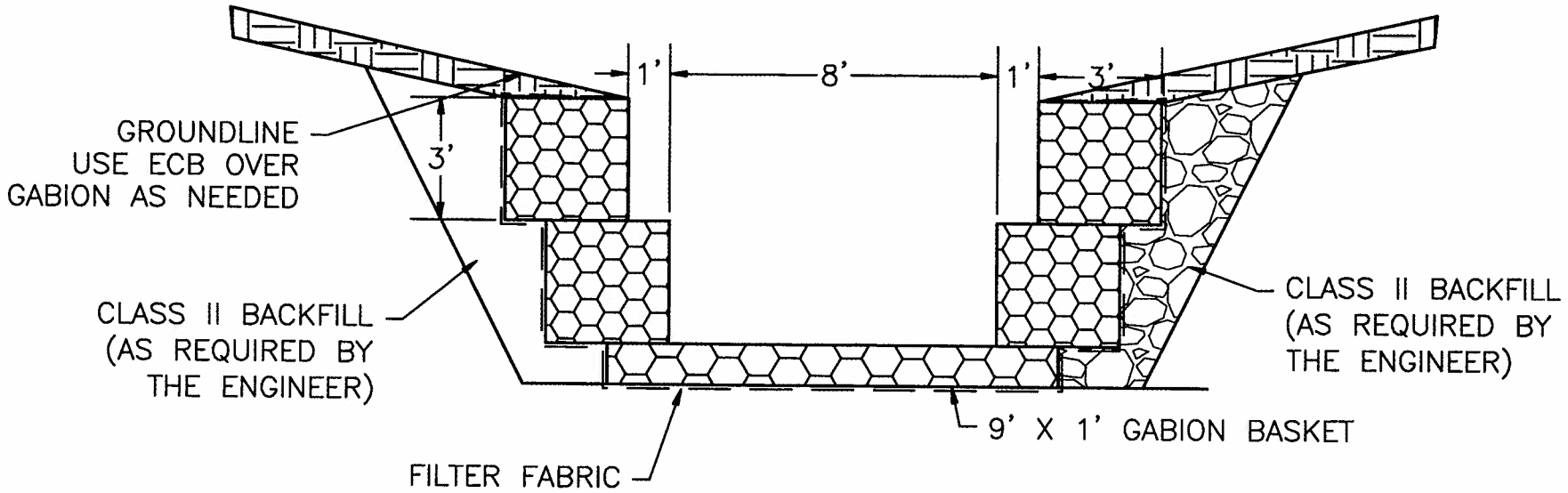


GABION	2.25 CY/LF
FILTER FABRIC	4.0 SY/LF
CLASS II BACKFILL	1.6 TON/LF
ECB	1 SY/LF

SCALE 1:4

6' FB RECTANGULAR GABION DITCH
AMLSUR 17

NOTE: FILTER FABRIC SHALL BE PLACED UNDER ALL DITCHES WITH CHANNELS FLATTER THAN 10%.

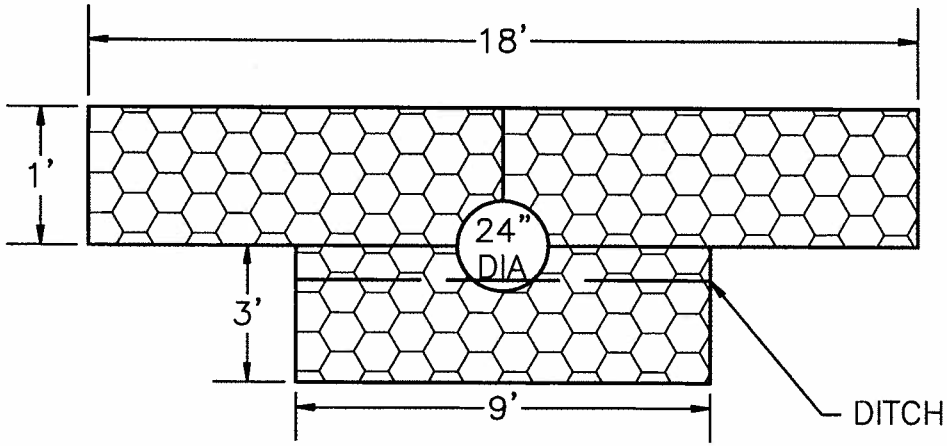


GABION	2.35 CY/LF
FILTER FABRIC	4.08 SY/LF
CLASS II BACKFILL	1.6 TON/LF
ECB	1 SY/LF

SCALE 1:4

8' FB RECTANGULAR GABION DITCH
AMLSUR 18

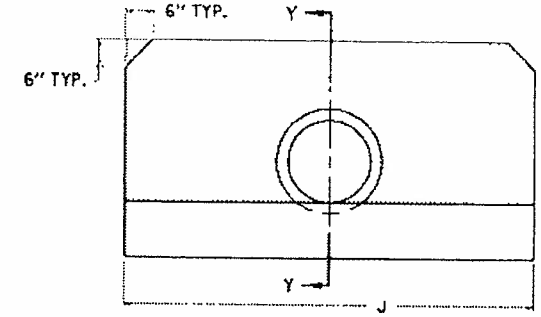
NOTE: 24" HDPE PIPE IS SET IN BOTTOM OF DITCH. FILTER FABRIC AROUND GABIONS NOT SHOWN.



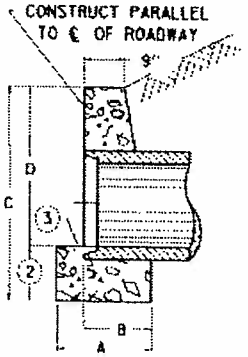
GABION 0.5 CY

SCALE 1:4

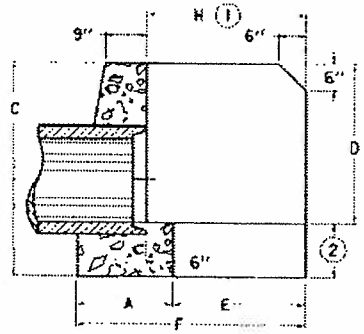
GABION HEADWALL
AMLSUR 19



ELEVATION VIEW



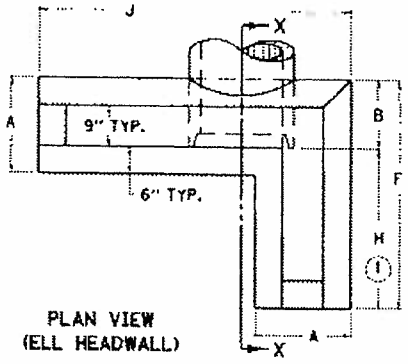
SECTION Y-Y



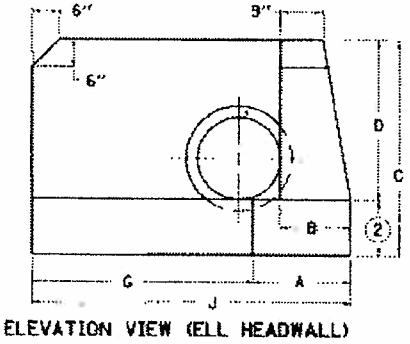
SECTION X-X

DIMENSIONS AND QUANTITIES

HEADWALL TYPE	PIPE DIAMETER	HEADWALL DIMENSIONS									CUBIC YARDS CONCRETE FOR ONE HEADWALL	
		A	B	C	D	E	F	G	H (1)	J	(EARTH)	(ROCK)
STANDARD	12"	1'-8"	1'-2"	4'-0"	2'-6"	—	—	—	—	6'-0"	1.05	0.87
	15"	1'-8½"	1'-2½"	4'-3"	2'-9"	—	—	—	—	6'-9"	1.25	1.03
	18"	1'-9"	1'-3"	4'-6"	3'-0"	—	—	—	—	7'-6"	1.48	1.23
	21"	1'-9½"	1'-3½"	4'-9"	3'-3"	—	—	—	—	8'-3"	1.73	1.46
	24"	1'-10"	1'-4"	5'-0"	3'-6"	—	—	—	—	9'-0"	1.99	1.69
	27"	1'-10½"	1'-4½"	5'-3"	3'-9"	—	—	—	—	9'-9"	2.27	1.93
RAISED	12"	1'-8"	1'-2"	4'-6"	3'-0"	—	—	—	—	7'-6"	1.45	1.23
	15"	1'-8½"	1'-2½"	4'-9"	3'-3"	—	—	—	—	8'-3"	1.69	1.43
	18"	1'-9"	1'-3"	5'-0"	3'-6"	—	—	—	—	9'-0"	1.96	1.67
	21"	1'-9½"	1'-3½"	5'-3"	3'-9"	—	—	—	—	9'-9"	2.25	1.93
	24"	1'-10"	1'-4"	5'-6"	4'-0"	—	—	—	—	10'-6"	2.54	2.19
	27"	1'-10½"	1'-4½"	5'-9"	4'-3"	—	—	—	—	11'-3"	2.88	2.49
STANDARD ELL	12"	1'-8"	1'-2"	4'-0"	2'-6"	2'-0"	3'-8"	3'-0"	2'-6"	4'-8"	1.19	0.99
	15"	1'-8½"	1'-2½"	4'-3"	2'-9"	2'-3"	3'-11½"	3'-6"	2'-9"	5'-2½"	1.42	1.19
	18"	1'-9"	1'-3"	4'-6"	3'-0"	2'-6"	4'-3"	4'-0"	3'-0"	5'-9"	1.67	1.41
	21"	1'-9½"	1'-3½"	4'-9"	3'-3"	2'-9"	4'-6½"	4'-6"	3'-3"	6'-3½"	1.93	1.63
	24"	1'-10"	1'-4"	5'-0"	3'-6"	3'-0"	4'-10"	5'-0"	3'-6"	6'-10"	2.22	1.89
	27"	1'-10½"	1'-4½"	5'-3"	3'-9"	3'-3"	5'-1½"	5'-6"	3'-9"	7'-4½"	2.52	2.15
RAISED ELL	12"	1'-8"	1'-2"	4'-6"	3'-0"	2'-9"	4'-5"	3'-9"	3'-3"	5'-5"	1.62	1.37
	15"	1'-8½"	1'-2½"	4'-9"	3'-3"	3'-0"	4'-8½"	4'-3"	3'-6"	5'-11½"	1.88	1.59
	18"	1'-9"	1'-3"	5'-0"	3'-6"	3'-3"	5'-0"	4'-9"	3'-9"	6'-6"	2.16	1.85
	21"	1'-9½"	1'-3½"	5'-3"	3'-9"	3'-6"	5'-3½"	5'-3"	4'-0"	7'-0½"	2.47	2.12
	24"	1'-10"	1'-4"	5'-6"	4'-0"	3'-9"	5'-7"	5'-9"	4'-3"	7'-7"	2.79	2.41
	27"	1'-10½"	1'-4½"	5'-9"	4'-3"	4'-0"	5'-10½"	6'-3"	4'-6"	8'-1½"	3.14	2.72



PLAN VIEW (ELL HEADWALL)



ELEVATION VIEW (ELL HEADWALL)

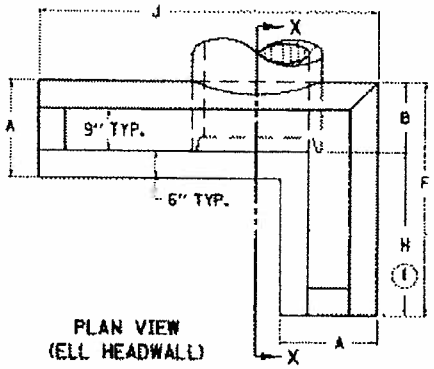
NOTES

1. THE DIMENSION AND/OR ANGLE OF INTERSECTION BETWEEN THE WALLS MAY BE VARIED ON CONSTRUCTION.
2. VOLUME BASED ON VALUES OF 18" ON EARTH, 12" ON ROCK.
3. FINISH BY FLOATING
4. CIRCULAR PIPE INCLUDES SLIGHTLY ELLIPTICAL CONCRETE PIPE WITH CIRCULAR REINFORCEMENT.

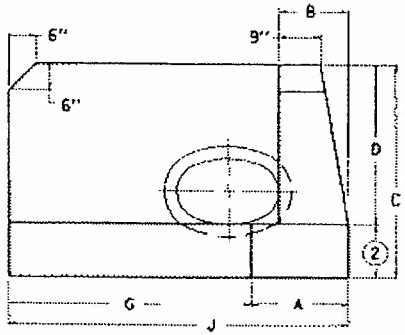
CONCRETE HEADWALLS
AMLSUR 20-1

DIMENSIONS AND QUANTITIES

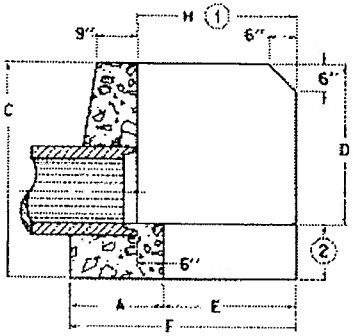
HEADWALL TYPE	ROUND EQUIVALENT	REINFORCED CONCRETE ELLIPTICAL PIPE SIZE OF PIPE	CORRUGATED METAL PIPE ARCH SIZE OF PIPE	HEADWALL DIMENSIONS A	B	C	D	E	F	G	H ①	J	VOLUME CU. YDS FOR 1 HEADWALL (EARTH)	VOLUME CU. YDS FOR 1 HEADWALL (ROCK)
STANDARD	15"	–	17" X 13"	1'-9"	1'-3"	4'-0"	2'-6"	—	—	—	—	7'-10"	1.43	1.18
	18"	23" X 14"	21" X 15"	1'-9"	1'-3"	4'-5"	2'-11"	—	—	—	—	8'-3"	1.64	1.33
	24"	30" X 19"	28" X 20"	1'-9"	1'-3"	4'-10"	3'-4"	—	—	—	—	9'-6"	2.10	1.79
	27"	34" X 22"	–	1'-10"	1'-4"	5'-2"	3'-8"	—	—	—	—	10'-6"	2.53	2.18
RAISED	15"	–	17" X 13"	1'-9"	1'-3"	4'-6"	3'-0"	—	—	—	—	9'-4"	1.89	1.59
	18"	23" X 14"	21" X 15"	1'-9"	1'-3"	4'-11"	3'-5"	—	—	—	—	9'-9"	2.11	1.62
	24"	30" X 19"	28" X 20"	1'-9"	1'-3"	5'-4"	3'-10"	—	—	—	—	11'-0"	2.68	2.18
	27"	34" X 22"	–	1'-10"	1'-4"	5'-8"	4'-2"	—	—	—	—	12'-0"	3.09	2.40
STANDARD ELL	15"	–	17" X 13"	1'-9"	1'-3"	4'-0"	2'-6"	1'-10"	3'-7"	4'-0"	2'-4"	5'-9"	1.41	1.16
	18"	23" X 14"	21" X 15"	1'-9"	1'-3"	4'-5"	2'-11"	2'-3"	4'-2"	4'-6"	2'-11"	6'-3"	1.86	1.76
	24"	30" X 19"	28" X 20"	1'-9"	1'-3"	4'-10"	3'-4"	2'-10"	4'-7"	5'-8"	3'-4"	7'-5"	2.48	2.30
	27"	34" X 22"	–	1'-10"	1'-4"	5'-2"	3'-8"	3'-2"	5'-0"	6'-5"	3'-8"	8'-3"	2.74	2.67
RAISED ELL	15"	–	17" X 13"	1'-9"	1'-3"	4'-6"	3'-0"	2'-4"	4'-1"	4'-9"	2'-10"	6'-6"	1.81	1.52
	18"	23" X 14"	21" X 15"	1'-9"	1'-3"	4'-11"	3'-5"	2'-11"	4'-8"	5'-3"	3'-5"	7'-0"	2.33	2.05
	24"	30" X 19"	28" X 20"	1'-9"	1'-3"	5'-4"	3'-10"	3'-4"	5'-1"	6'-5"	3'-10"	8'-2"	3.02	2.64
	27"	34" X 22"	–	1'-10"	1'-4"	5'-8"	4'-2"	3'-8"	5'-6"	7'-2"	4'-2"	9'-0"	3.26	2.83



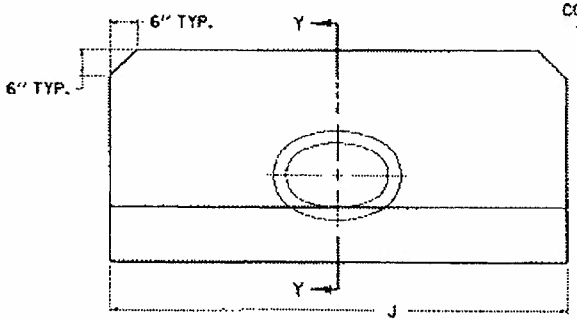
PLAN VIEW
(ELL HEADWALL)



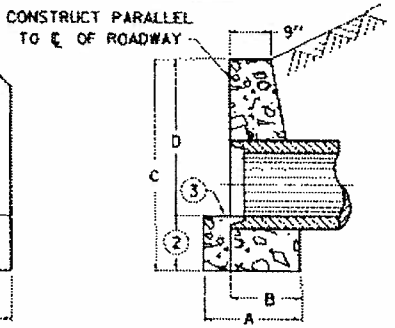
ELEVATION VIEW (ELL HEADWALL)



SECTION X-X



ELEVATION VIEW

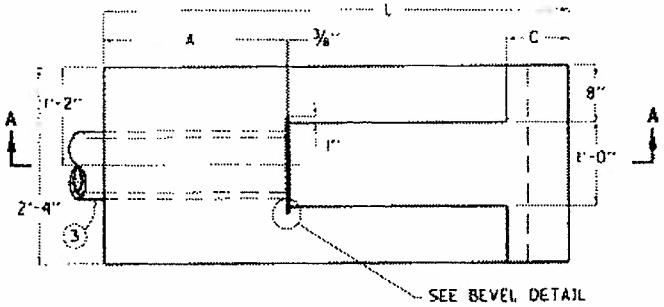


SECTION Y-Y

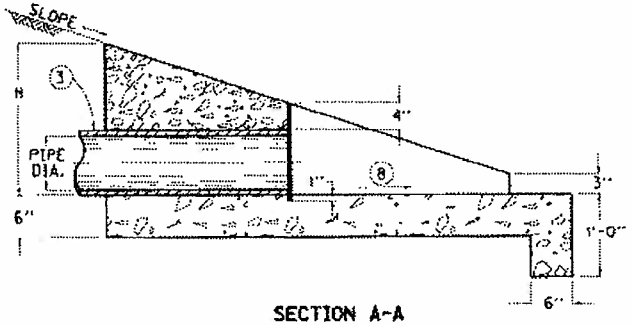
NOTES

(1) THE DIMENSION AND/OR ANGLE OF INTERSECTION BETWEEN THE WALLS MAY BE VARIED ON CONSTRUCTION.
(2) VOLUME BASED ON VALUES OF 18" ON EARTH, 12" ON ROCK.
(3) FINISH BY FLOATING

CONCRETE HEADWALLS
AMLSUR 20–2



PLAN VIEW



SECTION A-A

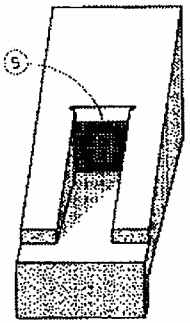
PIPE DIA.	SLOPE	DIMENSIONS				CLASS "A" CONCRETE
		L	H	A	C	CU. YD.
4" AND 6"	2 : 1	3'-4 1/8"	1'-8 1/16"	1'-6"	6"	0.38
	3 : 1	5'-1 1/16"		2'-3"	9"	0.56
	4 : 1	6'-9 1/4"		3'-0"	1'-0"	0.74
	6 : 1	7'-2 5/8"	1'-2 1/16"	1'-6"	1'-6"	0.62
8"	2 : 1	3'-9 1/2"	1'-10 1/4"	1'-6"	6"	0.43
	3 : 1	5'-8 1/4"		2'-3"	9"	0.63
	4 : 1	7'-7"		3'-0"	1'-0"	0.83
	6 : 1	8'-4 1/2"	1'-4 3/8"	1'-6"	1'-6"	0.73
10"	2 : 1	4'-2"	2'-1"	1'-6"	6"	0.47
	3 : 1	6'-3"		2'-3"	9"	0.69
	4 : 1	8'-4"		3'-0"	1'-0"	0.91
	6 : 1	9'-6"	1'-7"	1'-6"	1'-6"	0.83

-NOTES-

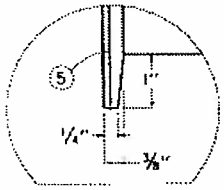
1. THE CONTRACT UNIT PRICE EACH SHALL INCLUDE LABOR, EXCAVATION, FORMS, CLASS "A" CONCRETE AND ALL INCIDENTALS NECESSARY FOR INSTALLATION OF THE HEADWALL AS DETAILED.

   BID ITEM:
   PERF PIPE HWALL TY ⊗ - △ INCH
   ⊗ 1 = 2:1 SLOPE
   2 = 3:1 SLOPE
   3 = 4:1 SLOPE
   4 = 6:1 SLOPE
   △ = PIPE DIA. IN INCHES
   BID ITEM EXAMPLE: PERF PIPE HWALL TY 2 - 6 INCH

2. THIS HEADWALL IS TO BE USED AT THE OUTLET END OF PERFORATED PIPE INSTALLATIONS.
3. APPROXIMATELY 8'-0" TO 12'-0" OF PIPE AT THE OUTLET SHALL BE NON-PERFORATED PIPE MEETING THE REQUIREMENTS OF THE PERFORATED PIPE, EXCEPT FOR PERFORATIONS. IF VITRIFIED CLAY PIPE IS USED, ALL JOINTS WHICH LIE WITHIN THE ABOVE LIMITS AND NOT ENCASED IN CONCRETE (SEE NOTE 4) SHALL BE IN ACCORDANCE WITH THE CURRENT ASTM C-443.
4. ANY PIPE WHICH HAS LESS THAN 1'-0" OF COVER OVER ITS TOP SHALL BE INCASED IN 6" OF CONCRETE ON ALL SIDES.
5. RODENT SCREEN OF 2x2 MESH 16 GAUGE (0.063 IN. DIA.) STEEL HEAVY (MAX.) HOT DIP GALVANIZED WOVEN WIRE CLOTH. THE MESH SHALL EXTEND A MINIMUM OF 1" ABOVE THE O.D. OF THE PIPE.
6. THE SLOT IS TO BE CONSTRUCTED SO THAT THE MESH CAN BE REMOVED FOR CLEANOUT PURPOSES.
7. BEVEL PERMITTED FOR EASY FORM REMOVAL
8. INSTALL OR CONSTRUCT HEADWALL TO SLOPE 4% TO INSURE POSITIVE OUTLET FLOW.

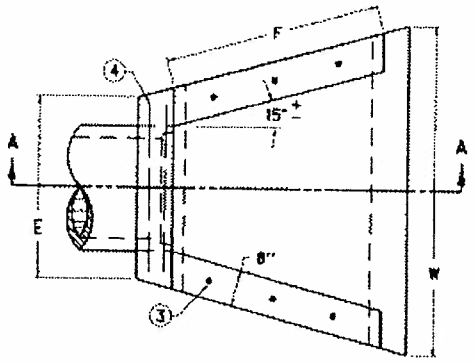


PICTORIAL VIEW

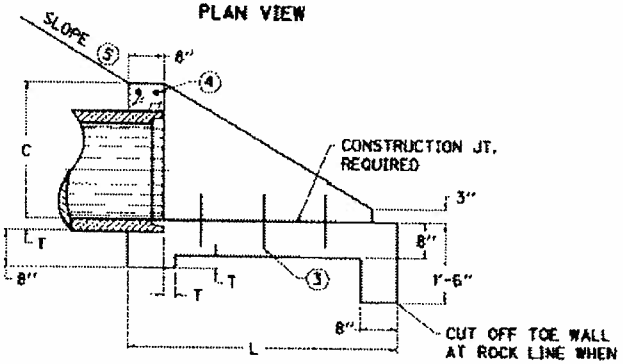


7 BEVEL DETAIL

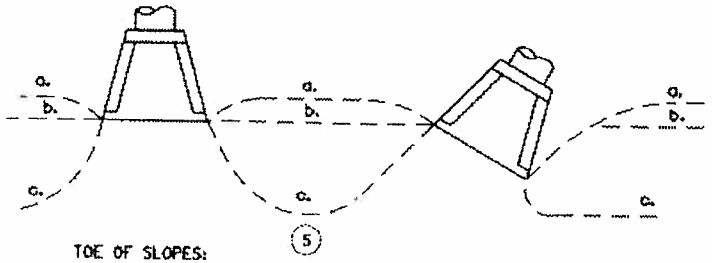
CONCRETE HEADWALLS
AMLSUR 20-3



PLAN VIEW



SECTION A-A

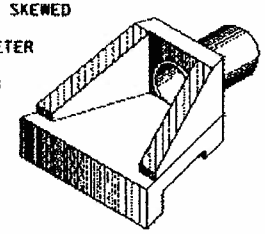


TOE OF SLOPES:
a. STEEPER THAN 2:1
b. 2:1
c. FLATTER THAN 2:1

PIPE DIA. OR EQUIV. DIA.	SHAPE (9)	DIMENSIONS C	E	F	L	W	T	CLASS A CONC C. Y.	REINF STEEL LBS.
12"	○	1'-9"	2'-6"	2'-3"	3'-6"	4'-0"	2"	0.58	7
15"	○	2'-0"	2'-9"	2'-9"	4'-0"	4'-9"	2¼"	0.75	
	⬭	1'-9"	3'-0"	2'-6"	3'-6"	4'-9"		0.68	8
18"	○	2'-3"	3'-0"	3'-6"	4'-6"	5'-3"	2½"	0.93	
	⬭	2'-0"	3'-6"	3'-0"	4'-0"	5'-6"	2¾"	0.89	
	⬬								
21"	○	2'-6"	3'-3"	4'-0"	5'-0"	6'-0"		1.14	
	⬭	2'-3"	3'-0"	3'-6"	4'-6"	6'-0"		1.07	9
24"	○	2'-9"	3'-6"	4'-6"	5'-6"	6'-6"	3"	1.35	8
	⬭	2'-6"	4'-0"	4'-0"	5'-0"	6'-9"	3¼"	1.30	9
	⬬								
27"	○	3'-0"	3'-9"	5'-0"	6'-0"	7'-0"		1.57	
	⬬	2'-9"	4'-6"	4'-3"	5'-3"	7'-3"	3½"	1.51	10

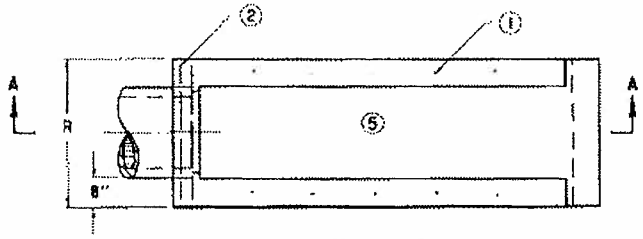
NOTES

1. DIMENSIONS AND QUANTITIES ARE BASED ON CONCRETE PIPE AND WILL VARY INSIGNIFICANTLY FOR CORRUGATED METAL PIPE.
2. REINFORCING STEEL : MINIMUM GRADE 40, BARS EVENLY SPACED.
3. 6 - NO. 4 x 1'-0" DOWEL BARS.
4. 2 - NO. 4 x (E DIMENSION MINUS 4").
5. SLOPES SHALL BE WARPED TO FIT HEADWALL WHEN PIPE IS SKEWED AND/OR NORMAL SLOPE VARIES FROM 2:1.
6. VOLUME DISPLACED BY PIPE COMPUTED USING INSIDE DIAMETER OF PIPE.
7. WING ANGLES AND/OR DIMENSIONS MAY BE ALTERED DURING CONSTRUCTION TO ACCOMMODATE FLOW OF WATER.
8. APRON BETWEEN WINGS SHALL BE SLOPED IN DIRECTION OF FLOW EQUAL TO SLOPE OF PIPE. FRONT FACE OF HEADWALL SHALL REMAIN VERTICAL.
9. HEADWALLS ARE FOR CIRCULAR, ARCH, AND HORIZONTAL ELLIPTICAL 12"- 27" EQUIVALENT PIPE SIZES. SEE CURRENT STD. DWG. RDI-016. FOR NON-CIRCULAR PIPE EQUIVALENT SIZES.

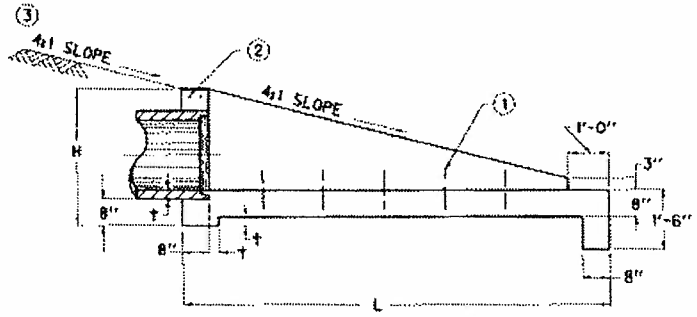


ISOMETRIC VIEW

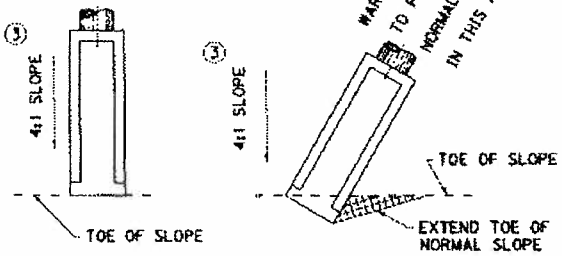
CONCRETE HEADWALLS
AMLSUR 20-4



PLAN VIEW



SECTION A-A



CONDITION NO. 1 CONDITION NO. 2

PLAN VIEW OF STRUCTURE LOCATIONS

- NOTES -

REINFORCING STEEL : MINIMUM GRADE 40, EVENLY SPACED

① 12 - NO. 4 X 1'-0" DOWEL BARS.

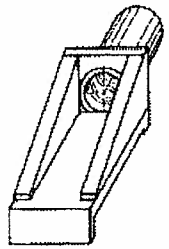
② 2 - NO. 4 X (R DIMENSION MINUS 4").

③ SLOPES SHALL BE WARPED TO FIT HEADWALL WHEN PIPE IS SKEWED AND/OR NORMAL SLOPE VARIES FROM 4 : 1.

④ SEE CURRENT STD. DWG. RDI-016 FOR NON-CIRCULAR PIPE EQUIVALENT SIZES.

⑤ APRON BETWEEN WINGS SHALL BE SLOPED IN DIRECTION OF FLOW EQUAL TO SLOPE OF PIPE. FRONT FACE OF HEADWALL SHALL REMAIN VERTICAL.

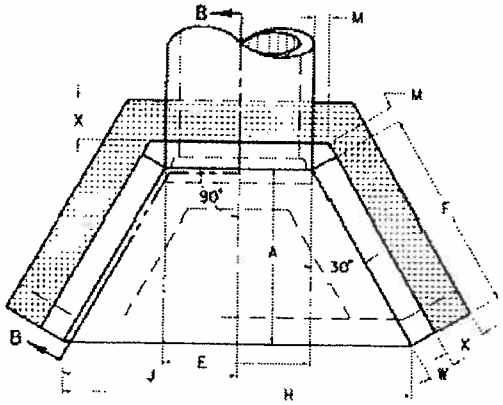
⑥ DIMENSIONS AND QUANTITIES ARE BASED ON CONCRETE PIPE AND WILL VARY SLIGHTLY FOR METAL PIPE.



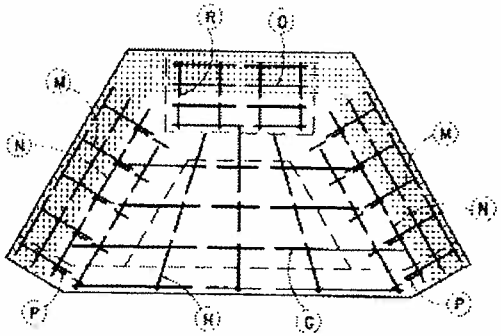
OBLIQUE VIEW

PIPE		DIMENSIONS ⑥				CLASS "A" CONC.	REINF. STEEL
DIA. OR EQUIV. DIA.	SHAPE ④	H	R	L	†	CU. YD.	LBS.
12"	○	2'-6"	2'-8"	7'-4"	2"	0.93	11
15"	○	2'-10"	3'-0"	8'-5"	2 1/4"	1.20	12
	⬭	2'-6"	3'-3"	7'-1"		1.02	
18"	○	3'-1"	3'-3"	9'-6"	2 1/2"	1.50	
	⬭	2'-9"	3'-7"	8'-0"		1.29	
	⬭	2'-10"	3'-9"	8'-3"	2 3/4"	1.38	13
21"	○	3'-5"	3'-7"	10'-7"		1.84	12

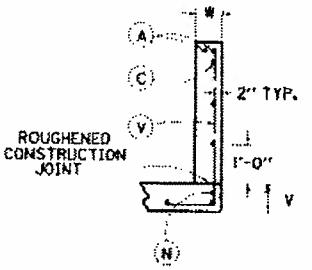
CONCRETE HEADWALLS
AMLSUR 20-5



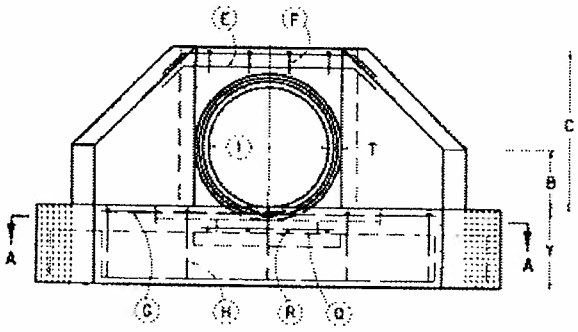
PLAN VIEW



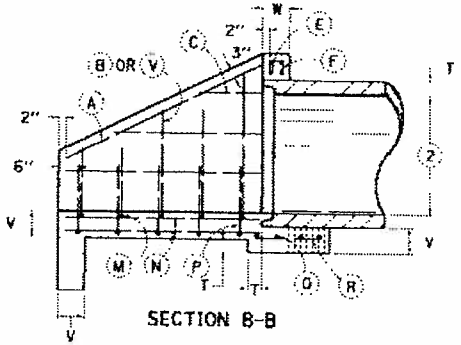
SECTION A-A



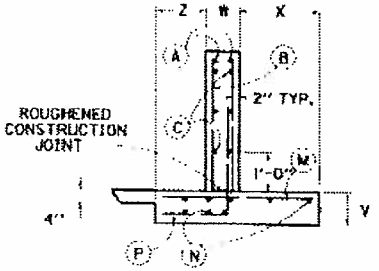
WING SECTION
30" TO 60" CIRCULAR PIPE
30" TO 72" NON-CIRCULAR PIPE



FRONT ELEVATION



SECTION B-B

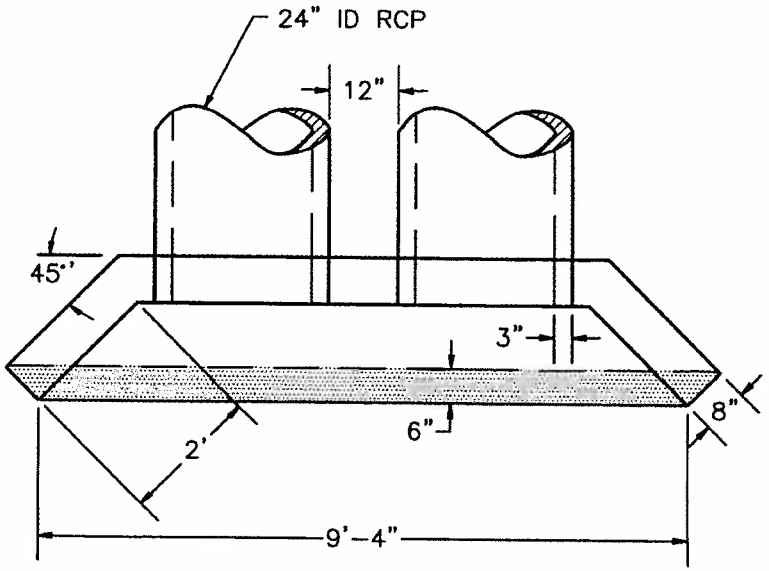


WING SECTION
66" TO 108" CIRCULAR PIPE

1. (1) DIAMETER OF CIRCULAR PIPE OR SPAN OF NON-CIRCULAR PIPE
2. (2) DIAMETER OF CIRCULAR PIPE OR RISE OF NON-CIRCULAR PIPE
3. [▭] APPLIES TO 66" DIAMETER AND GREATER. (CIRCULAR PIPE)
4. SEE CURRENT STANDARD DRAWINGS ROM-200 AND 300 SERIES FOR DIMENSIONS, QUANTITIES, AND BILL OF REINFORCEMENT.
5. DIMENSIONS FROM FACE OF CONCRETE TO STEEL SHALL BE 2" CLEAR DISTANCE.
6. ENCIRCLED LETTERS, (A), INDICATE STEEL BAR LOCATIONS
7. BARS (B), (C), (G), (P), (M), (V) ARE SPACED 1'-0" O.C. ALL OTHER BARS SHALL BE EVENLY SPACED.
8. BARS (B) AND (V) ARE PLACED IN ORDER OF INCREASING LENGTHS, BEGINNING AT THE END OF EACH WING.
9. BARS (C) ARE PLACED IN ORDER OF INCREASING LENGTHS, BEGINNING AT THE TOP OF EACH WING.
10. HEADWALLS LOCATED AT EDGE OF SHOULDER SHALL BE PARALLEL TO CENTERLINE OF THE ROAD.
11. APRON BETWEEN WINGS SHALL BE SLOPED IN DIRECTION OF FLOW EQUAL TO SLOPE OF PIPE. FRONT FACE OF HEADWALL AND ENDS OF WINGS SHALL REMAIN VERTICAL.

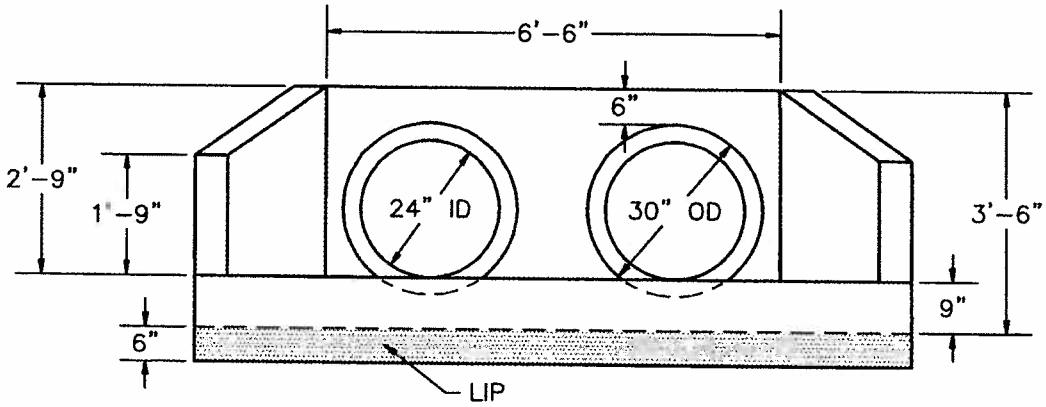
CONCRETE HEADWALLS
AMLSUR 20-6

CONCRETE: 1.07 CU. YDS.



PLAN VIEW

NOTE: IF SOLID ROCK IS ENCOUNTERED, THE 6" LIP SHALL BE DELETED AS DIRECTED BY THE ENGINEER.



FRONT ELEVATION

DOUBLE PIPE CULVERT CONCRETE HEADWALL
AMLSUR 21

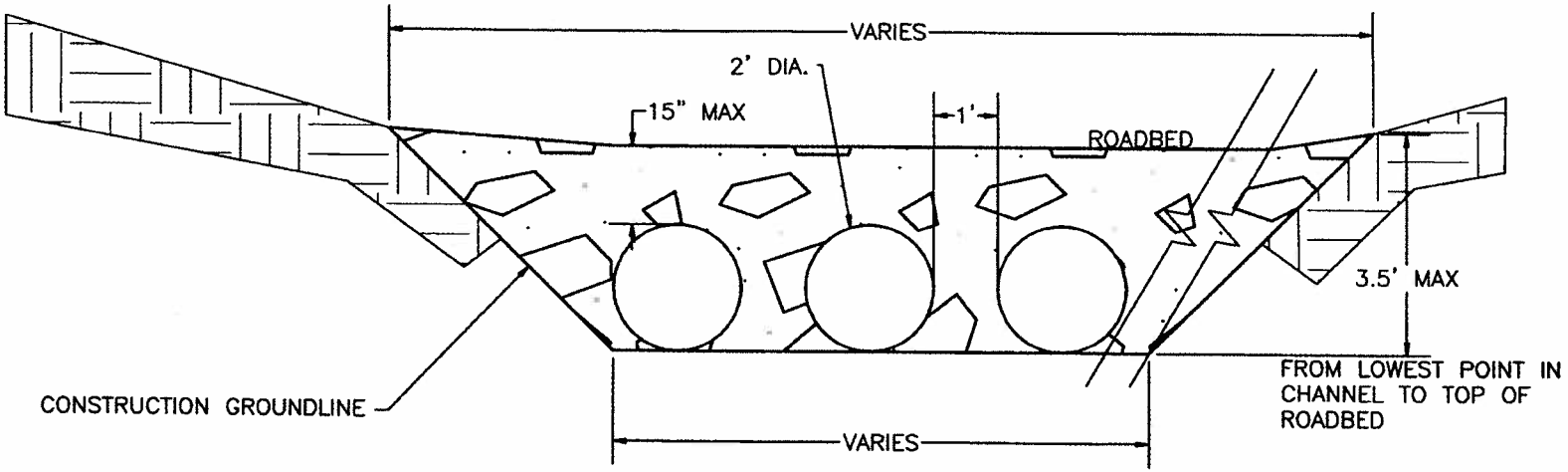
NOTE: TEMPORARY LOW-WATER CROSSING GUIDELINES IN ACCORDANCE WITH KY DIVISION OF WATER.

1. ALL KY DIVISION OF WATER GUIDELINES SHALL BE MET. SEE TECHNICAL SPECIFICATIONS.

2. NO MORE THAN 18" OF FILL OVER PIPES. PIPES AND BACKFILL MUST BE CONTAINED WITHIN STREAM CHANNEL AS SHOWN. NO MORE THAN ONE FOOT (1') SPACING BETWEEN PIPES WITH A MAXIMUM FILL HEIGHT OF 3.5 FT.

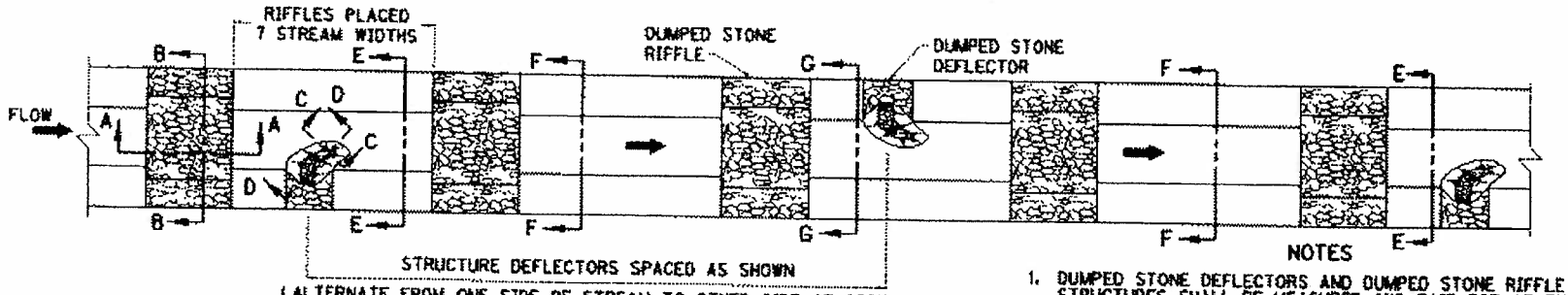
3. DURING CONSTRUCTION OF APPROACHES AND ACCESS ROADWAY, UNSTABLE AND UNCONSOLIDATED MATERIALS UNSUITABLE FOR ROADWAYS MAY BE EXCAVATED AND REPLACED WITH RIPRAP, CRUSHED STONE, OR OTHER STABLE ROAD CONSTRUCTION MATERIALS PROVIDED A) THE DISPOSAL OF EXCESS, UNCONSOLIDATED MATERIALS EXCAVATED MUST BE OUTSIDE OF THE FLOODPLAIN (IN WASTE AREA) AND B) THE FINISHED SURFACE OF THE COMPLETED ROAD MAY BE NO MORE THAN THREE INCHES (3") ABOVE THE PRE-CONSTRUCTION SURFACE OF THE FLOODPLAIN AT ANY POINT BEYOND THE TOP OF BANKS.

4. LOW-WATER CROSSING SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION DURATION. ALL PIPES SHALL BE INSPECTED AND CLEANED AS NEEDED TO ENSURE MAXIMUM HYDRAULIC CAPACITY

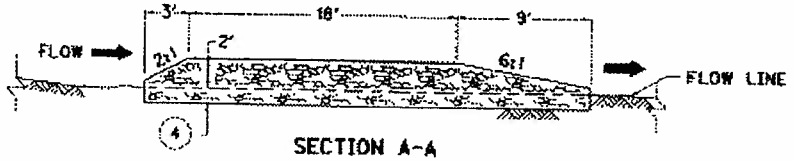


PIPE AS APPROVED 2' DIA ONLY; ALL PIPE LEVEL WITH LOW POINT OF ORIGINAL STREAMBED/CHANNEL

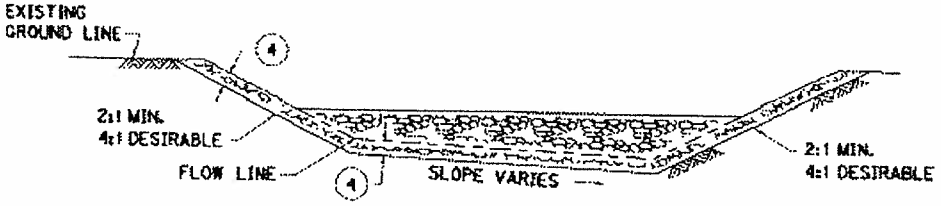
LOW-WATER CROSSING
AMLSUR 22



PLAN VIEW



SECTION A-A



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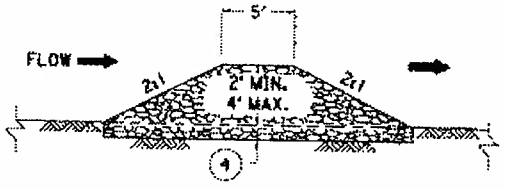

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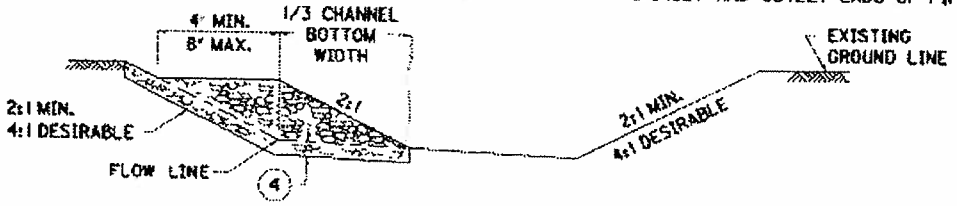
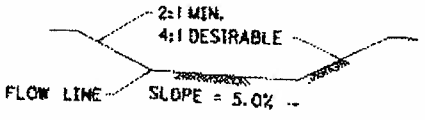
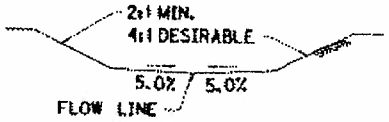


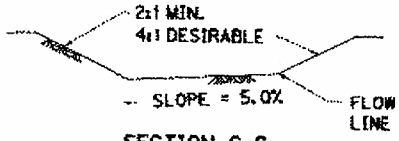
SECTION D-D



SECTION E-E



SECTION F-F



SECTION G-G

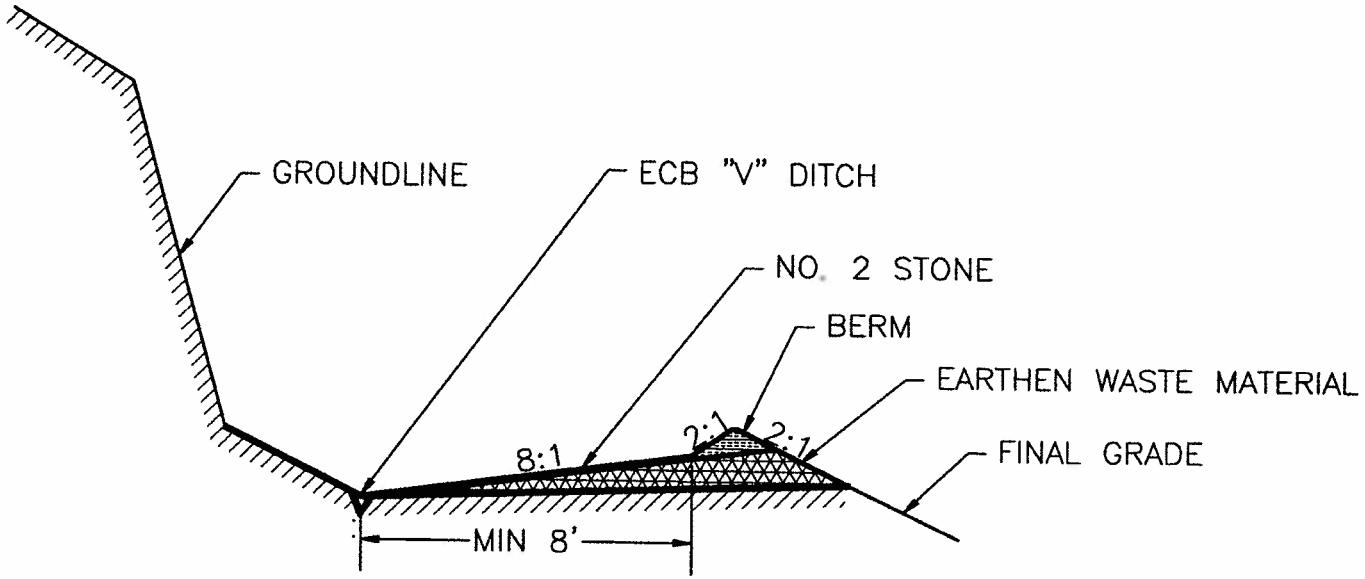
NOTES

1. DUMPED STONE DEFLECTORS AND DUMPED STONE RIFFLE STRUCTURES SHALL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE PER TON, AND SHALL INCLUDE ROCK, LABOR AND ALL INCIDENTALS NECESSARY FOR ONE COMPLETE INSTALLATION.

ITEM CODE	PAY ITEM	PAY UNIT
2617	DEFLECTOR - DUMPED STONE	TON
2738	RIFFLE STRUCTURE - DUMPED STONE	TON

2. LOCATION OF STRUCTURES ARE AS NOTED IN THE PLANS. MINOR ADJUSTMENTS ARE PERMITTED UPON APPROVAL BY THE ENGINEER.
3. ROCK USED TO CONSTRUCT RIFFLE STRUCTURES AND DUMP STONE DEFLECTORS SHALL CONSIST OF 80% IN THE RANGE OF FOUR (4) TO EIGHT (8) CUBIC FEET AND 20% SMALLER STONE TO FILL VOIDS.
4. ROCK SHALL BE KEYED ONE (1) TO TWO (2) FEET BELOW THE PROPOSED CHANNEL FLOW LINE AND/OR CHANNEL BANK.
5. DUMPED STONE DEFLECTORS AND DUMPED STONE RIFFLE STRUCTURES SHALL BE REQUIRED ON BLUELINE STREAM CHANNEL CHANGES WHEN THE CHANNEL CHANGE FLOW LINE IS EQUAL TO OR LESS THAN 3%, AND THE CHANNEL CHANGE IS 200 LINEAR FEET OR GREATER.
6. SEE PLANS FOR CHANNEL MITIGATION LOCATIONS.
7. WHEN PIPES ARE INVOLVED IN CHANNEL CHANGES CUT THE CHANNEL TO CONFORM WITH SECTION F-F, A DISTANCE OF 20 FEET FROM THE INLET AND OUTLET ENDS OF PIPE.

STREAM HABITAT IMPROVEMENT STRUCTURES
AMLSUR 23



TYPICAL ACCESS ROAD W/SIDE DITCH & BERM
AMLSUR 24